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Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress

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Summary

The Navy is proposing to maintain in coming years a fleet of 313 ships, including, among other things, 11 aircraft carriers, 48 attack submarines (SSNs), 88 cruisers and destroyers (including 7 DD(X) destroyers and 19 CG(X) cruisers), 55 small Littoral Combat Ships (LCSs), 31 amphibious ships, and a Maritime Prepositioning Force (Future), or MPF(F), squadron with 12 new-construction amphibious and sealift-type ships. Navy officials have also stated that they hope to avoid substantial year-to-year changes in the composition of the five- or six-year Navy shipbuilding plan.

The Navy's 313-ship proposal is intended to end a period of ambiguity and uncertainty in Navy ship force structure planning dating back to at least February 2003. This ambiguity, together with year-to-year volatility in the composition of the Navy's shipbuilding plan, created difficulties for Congress in conducting oversight of Navy budgets and programs, and for industry in making rational business-planning decisions. Ambiguity in Navy force-structure planning may also have created difficulties for the Navy in defending its requirements in discussions with the Office of the Secretary of Defense (OSD). Potential oversight issues for Congress include:

- Will the Navy's 313-ship proposal be endorsed by OSD as an official Department of Defense (DOD) planning goal? If not, where would that leave Navy ship force-structure planning?
- Does the 313-ship proposal include an appropriate number of ships?
- Is the 313-ship proposal affordable?
- Does the Navy's FY2007-FY2011 shipbuilding plan adequately support the 313-ship proposal?
- Does the Navy's FY2007-FY2011 shipbuilding plan adequately support the shipbuilding industrial base?

Regarding the first question, the final report on the DOD 2005 Quadrennial Defense Review (QDR) refrained from explicitly endorsing the 313-ship plan, stating only that DOD supports a Navy larger than today's 281-ship fleet that includes 11 aircraft carriers. Regarding the second question, factors to consider include the Navy's role in the global war on terrorism (GWOT) and the potential need in coming years to counter modernized Chinese maritime military forces. Regarding the third question, the Navy reportedly estimates that executing the 313-ship proposal would require an annual average of \$13.4 billion per year in 2005 dollars for new ship construction, while the Congressional Budget Office estimates it would require an annual average of \$18.3 billion per year in 2005 dollars (\$19.6 billion per year in 2007 dollars), or about 37% more. Regarding the fourth question, the Navy's FY2007-FY2011 shipbuilding plan includes 23 LCSs and 28 larger ships, or an average of 5.6 larger ships per year, which is less than the average of 7.3 larger ships per year that would be needed over the long run to maintain over the long run the 258 larger ships included in the 313-ship plan. An associated 30-year shipbuilding plan submitted to Congress does not maintain a force of 48 SSNs and 88 cruisers and destroyers consistently over the long run. This report will be updated when events warrant.

Contents

Introduction and Issue for Congress	1
Background	2
Composition Of 313-Ship Proposal	2
Independent Studies On Navy Force Structure	4
Navy FY2007-FY2011 Ship-Procurement Plan	4
Oversight Issues for Congress	6
Endorsement Of 313-Ship Proposal By OSD	6
Appropriateness Of 313-Ship Proposal	8
Numbers Of Individual Ship Types	8
Historical Fleet Numbers	8
Previous Force Structure Plans	9
Current Force-Planning Issues	10
Affordability of 313-Ship Proposal	13
Recent Funding For New Ships: \$10.2 Billion Per Year	13
Navy Estimate For 313-Ship Proposal: \$13.4 Billion Per Year	13
CBO Estimate For 313-Ship Proposal: \$18.3 Billion Per Year	14
Potential Oversight Questions	14
Adequacy Of Shipbuilding Plan For 313-Ship Fleet	15
Concept Of Steady-State Replacement Rate	15
Steady-State Replacement Rate For Proposed 313-Ship Fleet	15
Rate Need To Compensate For Below-Steady-State Procurement	16
Planned Procurement Rates Compared to These Rates	17
Attack Submarines	18
Cruisers And Destroyers	18
Adequacy Of Shipbuilding Plan For Industrial Base	18
Private-Sector Yards	19
Potential Areas Of Concern	19
Debate On Number Of Shipyards Needed	20
Legislative Activity	21
FY2006	21
FY2006 Defense Authorization (H.R. 1815/S. 1042)	21
FY2006 Defense Appropriation (H.R. 2863)	24
National Naval Force Structure Policy Act (H.R. 375)	25
Bills On Aircraft Carrier Force Levels (H.R. 304/S. 145)	25
FY2005	25
FY2005 Emergency Supplemental (H.R. 1268)	25
FY2005 Defense Authorization Act (H.R. 4200/P.L. 108-375)	28
FY2004	30
FY2004 Defense Authorization Act (H.R. 1588/P.L. 108-136)	30

Appendix A: Previous Ambiguity In Navy Ship Force-Structure Planning	31
310-Ship Plan From 2001 QDR	31
Navy 375-Ship Proposal Of 2002-2004	32
Early-2005 Navy Proposal For Fleet Of 260 To 325 Ships	32
Capabilities-Based Planning and Numbers of Ships	34
Implications of Ambiguity in Navy Force-Structure Plans	35
Appendix B: Independent Studies On Navy Force Structure	38
Force Structure Recommendations	38
Observations	46
Summary	60
Appendix C: Size of Navy and Navy Shipbuilding Rate	61

List of Tables

Table 1. Recent Navy Ship Force Structure Proposals	3
Table 2. Navy FY2007-FY2011 Ship-Procurement Plan	5
Table 3. Steady-State Ship Procurement Rate for 313-Ship Fleet	16
Table 4. Average Ship Procurement Rates	17
Table 5. CNA-Recommended Force and Other Proposals	39
Table 6. Alternative Fleet Structures from OFT Report	41
Table 7. CSBA-Recommended Force and Other Proposals	43
Table 8. Battle Force Ships Procured (FY1982-FY2006) or <i>Projected</i> (<i>FY2007-FY2011</i>)	61

Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress

Introduction and Issue for Congress

The Navy is proposing to maintain in coming years a fleet of 313 ships, including, among other things, 11 aircraft carriers, 48 attack submarines (SSNs), 88 cruisers and destroyers (including 7 DD(X) destroyers and 19 CG(X) cruisers), 55 Littoral Combat Ships (LCSs), 31 amphibious ships, and a Maritime Prepositioning Force (Future), or MPF(F), squadron with 12 new-construction amphibious and sealift-type ships.¹ Navy officials have also stated that they hope to avoid substantial year-to-year changes in the composition of the associated five- or six-year Navy shipbuilding plan.

The Navy's 313-ship proposal is intended to end a period of ambiguity and uncertainty in Navy ship force structure planning dating back to at least February 2003. This ambiguity, together with year-to-year volatility in the composition of the Navy's shipbuilding plan, created difficulties for Congress in conducting oversight of Navy budgets and programs, and for industry in making rational business-planning decisions. Ambiguity in Navy force-structure planning may also have created difficulties for the Navy in defending its requirements in discussions with OSD. For details on this previous period of ambiguity, see **Appendix A**.

The issue for Congress is how to respond to the Navy's 313-ship proposal and associated FY2007-FY2011 Navy shipbuilding plan. Decisions that Congress makes regarding Navy force structure and shipbuilding programs could significantly affect future U.S. military capabilities, Navy funding requirements, and the Navy shipbuilding industrial base.

The next section of the report discusses the following background questions:

- What types of ships are included in the 313-ship proposal, and how does this proposal compare to previous Navy ship force structure proposals?
- What independent studies are available concerning potential future Navy ship force structures?
- What ships are proposed for procurement in the Navy's FY2007-FY2011 ship-procurement plan?

The section that follows discusses the following potential oversight issues for Congress:

¹ U.S. Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY2007*. Washington, 2006. 8 pp.

- Will the Navy's 313-ship proposal be endorsed by OSD as an official DOD planning goal? If not, where would that leave Navy ship force-structure planning?
- Does the 313-ship proposal include an appropriate number of ships?
- Is the 313-ship proposal affordable?
- Does the Navy's FY2007-FY2011 shipbuilding plan adequately support the 313-ship proposal?
- Does the Navy's FY2007-FY2011 shipbuilding plan adequately support the shipbuilding industrial base?

The final section of the report presents recent legislative activity on these issues.

Background

Composition Of 313-Ship Proposal

What types of ships are included in the 313-ship proposal, and how does this proposal compare to previous Navy ship force structure proposals?

Table 1 shows the composition of the Navy's 313-ship proposal and compares it to other recent Navy force structure proposals. On the basis of the figures shown in the table, the 313-ship proposal can be viewed as somewhat or fairly consistent with other recent Navy ship force-structure proposals.

Table 1. Recent Navy Ship Force Structure Proposals

Ship type	Reported 2006 Navy proposal for 313-ship fleet	Early-2005 Navy proposal for fleet of 260-325 ships		2002-2004 Navy proposal for 375-ship Navy ^a	2001 QDR plan for 310-ship Navy
		260-ships	325-ships		
Ballistic missile submarines (SSBNs)	14	14	14	14	14
Cruise missile submarines (SSGNs)	4	4	4	4	2 or 4 ^b
Attack submarines (SSNs)	48	37	41	55	55
Aircraft carriers	11	10	11	12	12
Cruisers, destroyers, frigates	88	67	92	104	116
Littoral Combat Ships (LCSs)	55	63	82	56	0
Amphibious ships	31	17	24	37	36
MPF(F) ships ^c	12 ^c	14 ^c	20 ^c	0 ^c	0 ^c
Combat logistics (resupply) ships	30	24	26	42	34
Dedicated mine warfare ships	0	0	0	26 ^d	16
Other ^e	20	10	11	25	25
Total battle force ships	313	260	325	375	310 or 312

Sources: 2001 QDR report, U.S. Navy data, and *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY2007*.

a. Initial composition. Composition was subsequently modified.

b. The report on the 2001 QDR did not mention a specific figure for SSGNs. The Administration's proposed FY2001 DOD budget requested funding to support the conversion of two available Trident SSBNs into SSGNs, and the retirement of two other Trident SSBNs. Congress, in marking up this request, supported a plan to convert all four available SSBNs into SSGNs.

c. Today's 16 Maritime Prepositioning Force (MPF) ships are intended primarily to support Marine Corps operations ashore, rather than Navy combat operations, and thus are not counted as Navy battle force ships. The Navy's planned MPF (Future) ships, however, may be capable of contributing to Navy combat capabilities (for example, by supporting Navy aircraft operations). For this reason, MPF(F) ships are counted here as battle force ships.

d. The figure of 26 dedicated mine warfare ships includes 10 ships maintained in a reduced mobilization status called Mobilization Category B. Ships in this status are not readily deployable and thus do not count as battle force ships. The 375-ship proposal thus implied transferring these 10 ships to a higher readiness status.

e. Includes, among other things, command ships and support ships.

Independent Studies On Navy Force Structure

What independent studies are available concerning potential future Navy ship force structures?

Section 216 of the conference report (H.Rept. 108-354 of November 7, 2003) on the FY2004 defense authorization bill (H.R. 1588/P.L. 108-136 of November 24, 2003) required the Secretary of Defense to provide for two independently performed studies on potential future fleet platform architectures (i.e., potential force structure plans) for the Navy. The two studies, which were conducted by the Center for Naval Analyses (CNA) and the Office of Force Transformation (OFT, a part of the Office of the Secretary of Defense), were submitted to the congressional defense committees in February 2005.²

A third independent study on potential future fleet platform architectures, which was conducted by the Center for Strategic and Budgetary Assessments (CSBA) on its own initiative, was made available to congressional and other audiences in March 2005.

Appendix B summarizes these three studies.

Navy FY2007-FY2011 Ship-Procurement Plan

What ships are proposed for procurement in the Navy's FY2007-FY2011 ship-procurement plan?

Table 2 shows the Navy's FY2007-FY2011 ship-procurement plan will be submitted to Congress in February 2006.

² Section 216 is an amended version of a provision (Section 217) in the House-reported version of H.R. 1588. See H.Rept. 108-354, pp. 28-29, 612-613 and H.Rept. 108-106, pp. 255-256.

Table 2. Navy FY2007-FY2011 Ship-Procurement Plan
(Ships fully funded in FY2006 shown for reference)

	FY06	FY07	FY08	FY09	FY10	FY11	Total FY07-FY11
CVN-21			1				1
SSN-774	1	1	1	1	1	1	5
DD(X)		2 ^a	0 ^a	1	1	1	5
CG(X)						1	1
LCS	3 ^b	2	3	6	6	6	23
LPD-17	1		1				1
LHA(R)		1			1		2
TAKE	1	1	1				2
LHA(R)-MPF(F)						1	1
TAKE-MPF(F)				1	1	1	3
LMSR-MPF(F)					1	1	2
MLP-MPF(F)				1		1	2
JHSV				1	1	1	3
Total	6	7	7	11	12	14	51
Subtotal larger ships (i.e., ships other than LCSs)	3	5	4	5	6	8	28

Sources: Department of the Navy, *Highlights of the Department of the Navy FY 2007 Budget*, Chart 15 (p. 5-3), and *Draft Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2007*.

Key:

CVN-21: CVN-21 class nuclear-powered aircraft carrier
SSN-774: Virginia (SSN-774) class nuclear-powered attack submarine
DD(X): DD(X) class destroyer
CG(X) CG(X) class cruiser
LCS Littoral Combat Ship
LPD-17 San Antonio (LPD-17) class amphibious ship
LHA(R) LHA(R) class amphibious assault ship
TAKE Lewis and Clark (TAKE-1) class resupply ship
LHA(R)-MPF(F) Modified LHA(R) intended for MPF(F) squadron
TAKE-MPF(F) Modified TAKE intended for MPF(F) squadron
LMSR-MPF(F) Modified large, medium-speed, roll-on/roll-off (LMSR) sealift ship intended for MPF(F) squadron
MLP-MPF(F) Mobile Landing Platform ship intended for MPF(F) squadron
JHSV Joint High-Speed Vessel for use as an intratheater connector (i.e., transport) ship

a. Each of the two DD(X)s to be procured in FY2007 is to be split-funded (i.e., incrementally funded) across FY2007 and FY2008.

b. Includes one LCS funded through the Navy's research and development account and two LCSs funded through the Shipbuilding and Procurement, Navy (SCN) account.

Oversight Issues for Congress

Endorsement Of 313-Ship Proposal By OSD

Will the Navy's 313-ship proposal be endorsed by the Office of the Secretary of Defense (OSD) as an official DOD planning goal? If not, where would that leave Navy ship force-structure planning?

When asked about the Navy's 313-ship proposal in December 2005, Secretary of Defense Donald Rumsfeld reportedly replied that it is Navy capabilities, not numbers of ships, that count.³ When asked about the Navy's 313-ship proposal at a January 25, 2006, press conference, Secretary Rumsfeld declined to explicitly endorse the plan.⁴

³ Dave Ahearn, "Rumsfeld On Increasing Fleet Size: Capabilities, Not Numbers, Count," *Defense Today*, December 16, 2005.

⁴ The press conference included the following exchange:

Q. Mr. Secretary, can I take you back to what you said at the outset about the Navy and the reforms that Admiral [Vernon] Clark [the previous Chief of Naval Operations, or CNO] put in place to get more use out of a smaller fleet?

RUMSFELD: Uh-huh. (Affirmative response.)

Q. Admiral [Michael] Mullen [the current CNO] is understood now to be proposing a rebuilding of the Navy, adding more than 30 ships to get back up over 300. Are you suggesting that perhaps that's not necessary?

RUMSFELD: No, I agree with Admiral Mullen. He's doing a good job, and he was a very intimate part of Vern Clark's team, along with [previous Secretary of the Navy] Gordon England. They've done an excellent job in the Navy, and you know — what I'm trying to point out is that if you — if one focuses only on 20th-century metrics, how many ships, is it 500, 600, 400, 300, 200, you miss the point. The point is how many days do you have ships capable of being deployed to do what it is that naval vessels are there to do for the United States of America, to create presence and to be able to provide military power in various parts of the world.

And a naval ship today, in terms of lethality — first of all, the deployable days are not any different today with a Navy of just under 300 ships than they were when the Navy was 4(00) or 500 because we've increased their deployable days. And the lethality of those ships has gone up many fold. We used to talk about number of aircraft — number of sorties per target. Today, we're talking about number of targets per sortie, and the precision weapons make an enormous difference.

So what the Navy's done is important, and it's important for people to begin to start thinking about it in the 21st century, looking at the right metrics, rather than the last century's metrics.

(continued...)

The final report on DOD's 2005 Quadrennial Defense Review (QDR), released on February 3, 2006, states that DOD will "Build a larger fleet that includes 11 Carrier Strike Groups...."⁵ The Navy as of early-February 2006 included 281 ships. The report specifically mentions force-structure goals for several parts of DOD,⁶ but does not mention the Navy's 313-ship proposal or force-level goals for any ships other than aircraft carriers.⁷

Secretary Rumsfeld's reported response in December 2005, his statements at the January 25, 2006, press conference, and the final report on the QDR together suggest that OSD supports a Navy with 11 carrier strike groups and more than the early-February 2006 total of 281 ships, but not necessarily the Navy's proposed 313-ship fleet, including the Navy's proposed subtotals for ship types other than aircraft carriers. If the Navy's 313-ship proposal is not explicitly endorsed by OSD as an official DOD planning goal, it could lead to a continuation of, rather than an end to, the recent uncertainty in Navy ship force-structure planning.

⁴ (...continued)

(Source: DOD transcript of press conference.)

⁵ U.S. Department of Defense. *Quadrennial Defense Review Report*. Washington, 2006. (February 6, 2006) p. 48.

⁶ The report mentions specific force-structure goals for Army brigades (page 43), Army end strength (page 43), Marine Corps end strength (page 43), special force battalions (page 44; these are to be increased by one-third); psychological operations and civil affairs units (page 45; these are to be increased by 3,500 personnel); the Air Force B-52 bomber force (page 46); Air Force combat wings (page 47); Air Force Minuteman III ballistic missiles (page 50); and Air Force inter-theater airlift aircraft (page 54).

⁷ The report also states that based on a series of analyses, DOD

concluded that the size of today's forces — both the Active and Reserve Components across all four Military Departments — is appropriate to meet current and projected operational demands. At the same time, these analyses highlighted the need to continue re-balancing the mix of joint capabilities and forces.

(*Quadrennial Defense Review Report*, op cit, p. 41.)

Regarding the reference to "today's forces," the Navy, as mentioned earlier, included a total of 281 ships as of early-February 2006.

The QDR report also states that

policy decisions, such as mobilization policies and war aims, may change over time and have implications for the shape and size of U.S. forces. Finally, as part of a process of continuous reassessment and improvement, this wartime construct will be further developed over time to differentiate among the Military Departments as to how they should best size and shape their unique force structures, for use by the Combatant Commanders, since all parts of the construct do not apply equally to all capability portfolios.

(*Quadrennial Defense Review Report*, op cit, pp. 38-39.)

Appropriateness Of 313-Ship Proposal

Does the 313-ship proposal include an appropriate number of ships?

Numbers Of Individual Ship Types. Other CRS reports focus on individual categories of ships such as aircraft carriers,⁸ attack submarines,⁹ cruisers and destroyers,¹⁰ Littoral Combat Ships,¹¹ and amphibious and MPF(F) ships.¹² The discussion below focuses on some issues relating to the potential appropriateness of the overall size of the 313-ship proposal.

Historical Fleet Numbers. Historical figures for the total number of ships in the Navy are not necessarily a reliable yardstick for assessing the appropriateness of the Navy's proposed 313-ship fleet, particularly if the historical figures are more than a few years old, because the missions to be performed by the Navy, the mix of ships that make up the Navy, and the technologies that are available to Navy ships for performing missions all change over time. Due to changes in these variables, the historical number of ships in the fleet is at best a partial guide, and at worst a potentially misleading guide, to whether a 313-ship fleet would be appropriate in coming years for performing the Navy's required missions.

The Navy, for example, reached a late-Cold War peak of 568 battle force ships at the end of FY1987,¹³ and as of February 13, 2005 had declined to a total of 281

⁸ CRS Report RL32731, *Navy Aircraft Carriers: Proposed Retirement of USS John F. Kennedy — Issues and Options for Congress*, by Ronald O'Rourke. See also CRS Report RS20643, *Navy CVN-21 Aircraft Carrier Program: Background and Issues for Congress*, by Ronald O'Rourke.

⁹ CRS Report RL32418, *Navy Attack Submarine Force-Level Goal and Procurement Rate: Background and Issues for Congress*, by Ronald O'Rourke.

¹⁰ CRS Report RL32109, *Navy DD(X), CG(X), and LCS Ship Acquisition Programs: Oversight Issues and Options for Congress*, by Ronald O'Rourke, and CRS Report RS21059, *Navy DD(X) and CG(X) Programs: Background and Issues for Congress*, by Ronald O'Rourke.

¹¹ CRS Report RL32109, *op cit*, and CRS Report RS21305, *Navy Littoral Combat Ship (LCS): Background and Issues for Congress*, by Ronald O'Rourke.

¹² CRS Report RL32513, *Navy-Marine Corps Amphibious and Maritime Prepositioning Ship Programs: Background and Oversight Issues for Congress*, by Ronald O'Rourke.

¹³ Some publications, such as those of the American Shipbuilding Association, have stated that the Navy reached a peak of 594 ships at the end of FY1987. This figure, however, is the total number of active ships in the fleet, which is not the same as the total number of battle force ships. The battle force ships figure is the number used in government discussions of the size of the Navy. In recent years, the total number of active ships has been larger than the total number of battle force ships. For example, the Naval Historical Center states that as of November 16, 2001, the Navy included a total of 337 active ships, while the Navy states that as of November 19, 2001, the Navy included a total of 317 battle force ships. Comparing the total number of active ships in one year to the total number of battle force ships in another year is thus an apple-to-oranges comparison that in this case overstates the decline since FY1987 in the number of ships in the Navy. As a general rule (continued...)

battle force ships. The FY1987 fleet, however, was intended to meet a set of mission requirements that focused on countering Soviet naval forces at sea during a potential multi-theater NATO-Warsaw Pact conflict, while the February 2006 fleet is intended to meet a considerably different set of mission requirements centered on influencing events ashore by countering both land- and sea-based military forces of potential regional threats other than Russia, including non-state terrorist organizations. In addition, the Navy of FY1987 differed substantially from the February 2006 fleet in areas such as profusion of precision-guided air-delivered weapons, numbers of Tomahawk-capable ships, and sophistication of C4ISR systems.¹⁴

In coming years, Navy missions may shift again, to include, as a possible example, a greater emphasis on being able to counter improved Chinese maritime military capabilities.¹⁵ In addition, the capabilities of Navy ships will likely have changed further by that time due to developments such as more comprehensive implementation of networking technology and increased use of ship-based unmanned vehicles.

The 568-ship fleet of FY1987 may or may not have been capable of performing its stated missions; the 281-ship fleet of February 2006 may or may not be capable of performing its stated missions; and a fleet years from now with a certain number of ships may or may not be capable of performing its stated missions. Given changes over time in mission requirements, ship mixes, and technologies, however, these three issues are to a substantial degree independent of one another.

For similar reasons, trends over time in the total number of ships in the Navy are not necessarily a reliable indicator of the direction of change in the fleet's ability to perform its stated missions. An increasing number of ships in the fleet might not necessarily mean that the fleet's ability to perform its stated missions is increasing, because the fleet's mission requirements might be increasing more rapidly than ship numbers and average ship capability. Similarly, a decreasing number of ships in the fleet might not necessarily mean that the fleet's ability to perform stated missions is decreasing, because the fleet's mission requirements might be declining more rapidly than numbers of ships, or because average ship capability and the percentage of time that ships are in deployed locations might be increasing quickly enough to more than offset reductions in total ship numbers.

Previous Force Structure Plans. Previous Navy force structure plans, such as those shown in **Table 1**, might provide some insight into the potential adequacy of a proposed new force-structure plan, but changes over time in mission requirements, technologies available to ships for performing missions, and other force-planning factors suggest that some caution should be applied in using past force

¹³ (...continued)

to avoid potential statistical distortions, comparisons of the number of ships in the Navy over time should use, whenever possible, a single counting method.

¹⁴ C4ISR stands for command and control, communications, computers, intelligence, surveillance, and reconnaissance.

¹⁵ For a discussion, see CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities — Background and Issues for Congress*, by Ronald O'Rourke.

structure plans for this purpose, particularly if those past force structure plans are more than a few years old. The Reagan-era plan for a 600-ship Navy, for example, was designed for a Cold War set of missions focusing on countering Soviet naval forces at sea, which is not an appropriate basis for planning the Navy today.¹⁶

Current Force-Planning Issues. Current force-planning issues that Congress may consider in assessing the appropriateness of the Navy's 313-ship proposal include the following:

- naval requirements for the global war on terrorism (GWOT) and for irregular conflicts such as insurgencies;
- naval requirements for countering improved Chinese maritime military forces;
- new technologies that may affect U.S. Navy ship capabilities;
- additional forward homeporting and the Sea Swap concept;

¹⁶ Navy force structure plans that predate those shown in **Table 1** include the Reagan-era 600-ship plan of the 1980s, the Base Force fleet of more than 400 ships planned during the final two years of the George H. W. Bush Administration, the 346-ship fleet from the Clinton Administration's 1993 Bottom-Up Review (or BUR, sometimes also called Base Force II), and the 310-ship fleet of the Clinton Administration's 1997 QDR. The table below summarizes some key features of these plans.

Features of Recent Navy Force Structure Plans

Plan	600-ship	Base Force	1993 BUR	1997 QDR
Total ships	~600	~450/416 ^a	346	~305/310 ^b
Attack submarines	100	80/~55 ^c	45-55	50/55 ^d
Aircraft carriers	15 ^f	12	11+1 ^g	11+1 ^g
Surface combatants	242/228 ^h	~150	~124	116
Amphibious ships	~75 ⁱ	51 ^j	36 ^j	36 ^j

Source: Prepared by CRS based on DOD and U.S. Navy data.

- a. Commonly referred to as 450-ship plan, but called for decreasing to 416 ships by end of FY1999.
- b. Original total of about 305 ships was increased to about 310 due to increase in number of attack submarines to 55 from 50.
- c. Plan originally included 80 attack submarines, but this was later reduced to about 55.
- d. Plan originally included 50 attack submarines but this was later increased to 55.
- e. Plus two or four additional converted Trident cruise missile submarines (SSGNs) for the 2001 QDR plan and four additional SSGNs for the 375-ship proposal.
- f. Plus one additional aircraft carrier in the service life extension program (SLEP).
- g. Eleven active carriers plus one operational reserve carrier.
- h. Plan originally included 242 surface combatants but this was later reduced to 228.
- i. Number needed to lift assault echelons of one Marine Expeditionary Force (MEF) plus one Marine Expeditionary Brigade (MEB).
- j. Number needed to lift assault echelons of 2.5 MEBs. Note how number needed to meet this goal changed from Base Force plan to the BUR plan — a result of new, larger amphibious ship designs.

- DOD's increased emphasis on achieving full jointness in U.S. military plans and operations; and
- potential tradeoffs between funding Navy requirements and funding competing defense requirements.

Each of these is discussed briefly below.

Global War on Terrorism and Irregular Warfare. The potential effects of the GWOT and irregular conflicts such as insurgencies on requirements for U.S. ground forces have received much attention in recent months. The potential effects of these factors on requirements for U.S. naval forces has received somewhat less attention. In terms of ships, possible effects on requirements for U.S. naval forces include an increased emphasis on one or more of the following:

- ships (such as attack submarines, surface combatants, or aircraft carriers) that can conduct offshore surveillance of suspected terrorists and irregular military forces using either built-in sensors or embarked unmanned vehicles;
- ships (such as surface combatants, particularly smaller ones like the LCS) and smaller surface craft for conducting coastal patrol and intercept operations, including countering small boats and craft and countering pirate-like operations;¹⁷
- ships (such as attack submarines) for covertly inserting and recovering Navy special operations forces, known as SEALs;¹⁸
- ships (such as amphibious ships) for supporting smaller-scale Marine Corps operations ashore; and
- ships (such as aircraft carriers or large-deck amphibious assault ships) that can launch strike-fighters armed with smaller-scale precision guided weapons.

Although the primary stated missions of the LCS relate to defeating littoral anti-access forces of opposing countries rather than to countering terrorists, some observers view the inclusion of 55 LCSs in the Navy's proposed 313-ship fleet as evidence that the proposal is aimed in part at meeting operational demands associated with the Navy's role in the GWOT. Supporters of the Navy's planned MPF(F) squadron argue that this squadron could be valuable in sea-based counter-terrorist operations. In addition, the Navy in recent months has taken some actions that reflect a stated specific interest in increasing the Navy's role in the GWOT. Among these are the establishment of a Navy riverine force that is to consist of three squadrons of

¹⁷ Coast Guard cutters may also be well suited for such operations.

¹⁸ SEAL stands for Sea, Air, and Land.

12 boats each, and a total of about 700 personnel. These boats, as small craft, are not included in the Navy's proposed total of 313 ships.¹⁹

Chinese Maritime Military Forces. China's naval modernization has potential implications for required U.S. Navy capabilities in terms of preparing for a conflict in the Taiwan Strait area, maintaining U.S. Navy presence and military influence in the Western Pacific, and countering Chinese ballistic missile submarines. Preparing for a conflict in the Taiwan Strait area could place a premium on the following: on-station or early-arriving Navy forces, capabilities for defeating China's maritime anti-access forces, and capabilities for operating in an environment that could be characterized by information warfare and possibly electromagnetic pulse (EMP) and the use of nuclear weapons.

China's naval modernization raises potential issues concerning the size of the Navy; the Pacific Fleet's share of the Navy; forward homeporting of Navy ships in the Western Pacific; the number of aircraft carriers, submarines, and ASW-capable platforms; Navy missile defense, air-warfare, anti-air warfare (AAW), antisubmarine warfare (ASW), and mine warfare programs; Navy computer network security; and EMP hardening of Navy systems. Aircraft carriers, cruisers and destroyers, and attack submarines are viewed by some observers as ships that might be particularly appropriate for countering improved Chinese maritime military forces.²⁰

New Technologies. New technologies that will likely affect the capabilities of Navy ships in coming years, and consequently the number of ships that may be needed to perform a given set of missions, include improved radars and other sensors (including miniaturized sensors); improved computers and networking systems; unmanned vehicles; reduced-size, precision-guided, air-delivered weapons; electromagnetic rail guns; directed-energy weapons (such as lasers); and integrated electric-drive propulsion technology, to name just a few. Historically, the effect of improving technology historically has often been to increase the capability of individual Navy ships and thereby permit a reduction in the number of Navy ships needed to perform a stated set of missions. However, some analysts believe that networking technology and reduced-sized sensors may argue in favor of a more distributed force structure that includes a larger number of smaller ships such as the LCS.

Forward Homeporting and Sea Swap. The Navy is considering transferring an aircraft carrier from the continental United States to either Hawaii or Guam and increasing the number of attack submarines homeported at Hawaii or Guam. The Navy has also experimented with the concept of deploying a Navy ship for an extended period of time (e.g., 12, 18, or 24 months, rather than the traditional deployment period of 6 months) and rotating successive crews out the ship every 6

¹⁹ For further discussion of the Navy's role in the GWOT, see CRS Report RS22373, *Navy Role in Global War on Terrorism (GWOT) — Background and Issues for Congress*, by Ronald O'Rourke.

²⁰ For further discussion, see CRS Report RL33153, *China Naval Modernization: Implications for U.S. Navy Capabilities — Background and Issues for Congress*, by Ronald O'Rourke.

months — a concept the Navy calls Sea Swap. Other things held equal, homeporting additional Navy ships in forward locations such as Guam and Hawaii, and applying the Sea Swap concept to a significant portion of the fleet, could reduce, perhaps substantially, the total number of Navy ships needed to maintain a certain number of Navy ships in overseas operating areas on a day-to-day basis. For some types of ships, additional forward homeporting and use of Sea Swap might reduce the number of ships needed for maintaining day-to-day forward deployments below the number needed for fighting conflicts. In such cases, fully implementing the force-level economies suggested by forward homeporting and Sea Swap could leave the Navy with inadequate forces for fighting conflicts.²¹

Jointness. DOD's increased emphasis on achieving increased jointness (i.e., coordination and integration of the military services) in U.S. military plans and operations could lead to reassessments of requirements for Navy capabilities that were originally determined in a less-joint setting. Areas where U.S. Navy capabilities overlap with the those of the Air Force or Army, and where total U.S. capabilities across the services exceed DOD requirements, might be viewed as candidates for such reassessments, while capabilities that are unique to the Navy might be viewed as less suitable for such reassessments. An example of a broad area shared by the Navy, Air Force, and Army is tactical aviation, while an example of an area that is usually regarded as unique to the Navy is antisubmarine warfare.

Competing Defense Priorities. A final issue to consider are the funding needs of other defense programs. In a situation of finite defense resources, funding certain Navy requirements may require not funding certain other defense priorities. If so, then the issue could become how to allocate finite resources so as to limit operational risk over the various missions involving both Navy and non-Navy mission requirements.

Affordability of 313-Ship Proposal

Is the 313-ship proposal affordable?

The affordability of the Navy's 313-ship proposal appears to depend in large part on the Navy's ability to substantially increase annual funding for construction of new ships and to constrain ship procurement costs.

Recent Funding For New Ships: \$10.2 Billion Per Year. From FY2000 to FY2005, funding for construction of new ships averaged about \$10.2 billion per year.²²

Navy Estimate For 313-Ship Proposal: \$13.4 Billion Per Year. The Navy reportedly estimates that executing the 313-ship proposal would require an

²¹ For additional discussion of Sea Swap, see CRS Report RS21338, *Navy Ship Deployments: New Approaches — Background and Issues for Congress*, by Ronald O'Rourke.

²² Source: Congressional Budget Office, December 16, 2005.

annual average of about \$13.4 billion per year in 2005 dollars for new ship construction, or about 31% more than the average figure for 2005-2005.

CBO Estimate For 313-Ship Proposal: \$18.3 Billion Per Year. The Congressional Budget Office (CBO), in an analysis released on December 16, 2005, estimates that executing the 313-ship proposal would require an annual average of about \$18.3 billion per year in 2005 dollars for new ship construction (about \$19.6 billion per year in 2007 dollars). This is about 37% more than the Navy's estimate, and about 79% more than the average figure for 2000-2005. The report states:

The Navy's plan to achieve a 313-ship fleet with \$14.4 billion in annual new-ship construction spending appears to assume that costs will somehow be controlled more stringently on future classes of ships than they have been on ships that the Navy is building now....

Even if those apparent cost targets for the 313-ship plan can be achieved, however, the [Navy's estimate] does not appear to take into account the higher inflation that the naval shipbuilding industry in the United States has been experiencing in the past decade. An analysis by the Navy of the inflationary component of past cost increases in shipbuilding programs indicates that inflation in such programs is expected to be about 1.3 percent higher per year, on average, than the inflation anticipated for the Department of Defense's procurement programs as a whole, at least through 2011. CBO assumes that the difference between inflation for general procurement programs and inflation for ship programs represents real growth in the cost of building ships that should be included in future estimates.²³

Potential Oversight Questions. Potential oversight questions for Congress include the following:

- Under current and projected budget conditions, how likely is it that the Navy will be able to increase funding for construction of new ships from the recent level of about \$10 billion per year to the Navy's estimated required level of \$13.4 billion per year? To achieve and maintain the \$13.4-billion annual average for new ship construction, what other Navy procurement programs does the Navy plan to reduce, and what assumptions does the Navy make about its ability to control personnel and operation and maintenance (O&M) expenditures? What might be the operational effects of the proposed reductions to the other Navy procurement programs, and how reasonable are the Navy's assumptions regarding its ability to control personnel and O&M expenditures?
- Is the cost to execute the 313-ship proposal likely to be closer to the Navy's estimate or CBO's estimate? In light of recent cost growth for Navy ships under construction, and recent increases in estimated

²³ Congressional Budget Office, *Resource Implications of the Navy's 313-Ship Plan*, December 16, 2005. 10 pp. The report is available at [<http://www.cbo.gov>].

procurement costs for Navy ships planned for procurement, which of these two estimates is likely to be more accurate?

- If the cost to execute the 313-ship proposal turns out to be closer to CBO's estimate, how likely is it that the Navy will be able to increase annual funding for new ship construction to the required level?
- If the Navy is not able to increase annual funding for new ship construction to the required level (whether that level is closer to the Navy's estimate or CBO's), what parts of the 313-ship proposal might be reduced?

Adequacy Of Shipbuilding Plan For 313-Ship Fleet

Does the Navy's FY2007-FY2011 shipbuilding plan adequately support the Navy's 313-ship fleet proposal?

Concept Of Steady-State Replacement Rate. Members of Congress and other observers have expressed concern in recent years that the rate of Navy shipbuilding since the early 1990s has been below the so-called steady-state replacement rate for a fleet of about 300 ships. The steady-state replacement rate is the average annual ship procurement rate that would be needed over the long run to maintain a fleet of a certain planned size over the long run. It is equal to the size of the planned fleet divided by the weighted average service life of the ships making up the planned fleet.

For example, a planned 300-ship fleet whose ships had a weighted average service life of 35 years, would have a steady-state replacement rate of 300 divided by 35, or about 8.6 ships per year. Using these figures, maintaining a 300-ship fleet over the long run would require a long-term (i.e., 35-year) average ship procurement rate of about 8.6 ships per year. The ship procurement rate could be below 8.6 ships per year during some years, as long as it was above 8.6 ships per year during other years, so that the average rate for the entire 35-year fleet replacement period comes back to 8.6 ships per year.

Steady-State Replacement Rate For Proposed 313-Ship Fleet. As shown in **Table 3**, the steady-state procurement rate for the Navy's proposed 313-ship fleet would be roughly 9.5 ships per year for ships of all types, and roughly 7.3 per year for larger ships (i.e., ships other than LCSs). As shown in **Appendix C**, annual procurement of new Navy ships has been below this rate since FY1993.

Table 3. Steady-State Ship Procurement Rate for 313-Ship Fleet
(average annual procurement rates)

Ship type	Expected service life (years)	313 ships	
		Number	Steady-state rate
SSBNs	42	14	0.33
SSGNs	42	4	0.10
SSNs	33	48	1.45
Aircraft carriers	50	11	0.22
Cruisers, destroyers	35	88	2.51
LCSs	25	55	2.20
Amphibious	35	31	0.89
MPF(F)s	35	12	0.34
CLF ^a	35	30	0.86
Other ^b	35	20	0.57
Total all ships		313	9.47
Subtotal larger ships (i.e., ships other than LCSs)		258	7.27

Source: Prepared by CRS based on U.S. Navy data for ship expected service lives.

a. Combat Logistics Force ships (i.e., ships that resupply Navy combat ships).

b. Includes command ships and support ships.

The planned ship service lives shown in this table are based on Navy planning data. If actual ship service lives turn out to be shorter than shown in the table, as some observers believe they might be based on historical evidence with previous classes of Navy ships, then the steady-state replacement rate figures would be higher than those shown in the table.

Rate Need To Compensate For Below-Steady-State Procurement.

To compensate for the below-steady-state rate of Navy ship procurement since the early 1990s (see **Appendix C**), maintaining a fleet of about 313 ships, including 55 LCSs, will require an average procurement rate in coming years higher than the steady-state rate shown in **Table 3**. Assuming an average 35-year life for Navy ships, the required rate might be about 11.2 ships per year including LCSs, and about 8.7 ships per year for ships other than LCSs.²⁴ If average ship life is assumed to be closer

²⁴ The decline in the rate of Navy ship procurement to relatively low levels began about FY1993. During the 14-year period FY1993-FY2006, a total of 78 battle force ships (including 3 LCSs) were procured, or an average of about 5.6 ships per year. Subtracting these 78 ships from a total fleet of 313 ships would leave a total of 235 ships to be procured during the remaining 21 years of a 35-year procurement period for replacing the entire fleet. Procuring these ships over a 21-year period would require an average procurement rate of about 11.2 ships per year. A total of 183 ships other than LCSs (258 ships other than LCSs required minus 75 ships other than LCSs procured during FY1993-FY2006) would need to be procured (continued...)

to 30 years, which some observers believe is a more realistic figure, then the required shipbuilding rate might be closer to about 14.7 ships per year including LCSs, and about 11.4 ships per year for ships other than LCSs.²⁵

Planned Procurement Rates Compared to These Rates. As shown in **Table 2**, the Navy's proposed FY2007-FY2011 shipbuilding plan includes a total of 51 ships of all kinds, or an average of 10.2 ships per year. As also shown in **Table 2**, however, 23 of the 51 ships are relatively small and inexpensive LCSs. The remaining 28 larger ships shown in **Table 2** equate to an average procurement rate of 5.6 larger ships per year.

Table 4 compares these planned procurement rates with the steady-state replacement rates for the Navy's proposed 313-ship Navy and the rates needed to compensate for the relatively low rates of Navy ship procurement since the early 1990s.

Table 4. Average Ship Procurement Rates

(Average number of ships procured per year)

	Average rate in Navy's FY2007- FY2011 plan	Steady-state rate for 313-ship fleet	Compensatory rate needed for 313-ship fleet ^a
All ships	10.2	9.5	11.2
Larger ships (i.e., ships other than LCSs)	5.6	7.3	8.7

Source: Prepared by CRS using Navy data.

a. Average rate needed over next 21 years (FY2007-FY2027) to compensate for relatively low ship procurement rate during previous 14 years (FY1993-FY2006), so as to achieve required steady-state replacement rate over the entire 35-year replacement period (FY1993-FY2027).

As can be seen in the table, the average of 10.2 ships of all types in the FY2007-FY2011 plan is greater than the steady-state rate of 9.5 ships per year, but less than the 11.2 ships per year that would be needed to compensate for the relatively low rate of ship procurement since FY1993. As can also be seen in the table, when the relatively small and inexpensive LCSs are set aside, the remaining average of 5.6 larger ships per year is less than both the steady-state rate of 7.3 ships per year and the compensatory rate of 8.7 ships per year. The average larger-ship procurement rate of 5.6 ships per year, if maintained over a 35-year period, would produce a total of 196 ships, or 62 ships less than the total of 258 included in the 313-ship plan. If

²⁴ (...continued)

over these 21 years, or an average of 8.7 ships per year for ships other than LCSs.

²⁵ Extending the analysis in the previous footnote, a total of 235 ships of all kinds divided by the 16 remaining years in a 30-year procurement period equates to an average rate of about 14.7 ships per year, while a total of 183 ships other than LCSs divided by 16 years equates to an average rate of about 11.4 ships per year for ships other than LCSs.

these 196 ships are added to the planned total of 55 LCSs, it would produce a total fleet of 251 ships.

Attack Submarines. Within the Navy's proposed 313-ship fleet is a requirement for a force of 48 attack submarines. As discussed in detail in another CRS report,²⁶ a 30-year Navy shipbuilding plan submitted to Congress in February 2006 — a plan that includes the 5-year period FY2007-FY2011 plus an additional 25 years beyond FY2011²⁷ — shows a 30-year procurement profile for attack submarines that, if implemented, would not maintain an 88-boat attack submarine force consistently over the long run. As discussed in this CRS report, the attack submarine force under the 30-year procurement profile would drop below 48 boats in 2018, reach a minimum of 40 boats (or 17% less than the required figure of 48) in 2028 and 2029, and remain below 48 boats through 2033.

Cruisers And Destroyers. Within the Navy's proposed 313-ship fleet is a requirement for 88 cruisers and destroyers. As discussed in another CRS report,²⁸ the Navy's 30-year shipbuilding plan submitted to Congress in February 2006 shows a 30-year procurement profile for cruisers and destroyers that, if implemented, would not maintain an 88-ship cruiser-destroyer force over the long run. As discussed in this CRS report, the cruiser-destroyer force under the 30-year procurement profile would drop below 88 ships in 2027, reach a minimum of 62 ships (or 30% less than the required figure of 88) in 2044-2046, and increase to a long-term plateau of 70 ships (or 20% less than 88) in the 2050s.

Adequacy Of Shipbuilding Plan For Industrial Base

Does the Navy's FY2007-FY2011 shipbuilding plan adequately support the shipbuilding industrial base?

Members of Congress and other observers have expressed concern in recent years that planned rates of Navy shipbuilding might not adequately support the shipbuilding industrial base, at least in its current form. The shipbuilding industrial base includes:

- private-sector shipyards that build all the Navy's ships and also perform some overhaul and repair work on Navy ships;

²⁶ CRS Report RL32418, *Navy Attack Submarine Force-Level Goal and Procurement Rate: Background and Issues for Congress*, by Ronald O'Rourke. See in particular Table 5 and the text discussing this table.

²⁷ U.S. Department of the Navy, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY2007*. Washington, 2006. 8 pp.

²⁸ CRS Report RL32109, *Navy DD(X), CG(X), and LCS Ship Acquisition Programs: Oversight Issues and Options for Congress*, by Ronald O'Rourke. See in particular Table 8 and the text discussing this table.

- four public-sector shipyards that perform most of the overhaul and repair work on Navy ships;²⁹
- hundreds of supplier firms in various states that provide materials and components for Navy ships; and
- laboratories, research and development centers, and independent naval architectural firms.

Private-Sector Yards. The private-sector yards that build the Navy's ships include six larger yards that have built the Navy's major warships in recent years and three additional yards that are to build LCSs. The six larger yards are:

- General Dynamics(GD)/Bath Iron Works (BIW) of Bath, ME;
- GD/Electric Boat (EB) of Groton, CT, and Quonset Point, RI;
- GD/National Steel and Shipbuilding Company (NASSCO) of San Diego, CA;
- Northrop Grumman (NG)/Avondale Shipyards, located near New Orleans, LA;
- NG/Ingalls Shipbuilding of Pascagoula, MS;³⁰ and
- NG/Newport News Shipbuilding (NGNN) or Newport News, VA.

The three yards that are to build LCSs are:

- Austal USA of Mobile, AL, which is the production shipyard on the LCS industry team led by General Dynamics;³¹
- Bollinger Shipyards of Louisiana and Texas, which is one of two production shipyards on the LCS industry team led by Lockheed Martin;³² and
- Marinette Marine of Marinette, WI, which is the other production shipyard on the Lockheed-led LCS industry team.

Private-sector yards other than the nine listed above perform some of the overhaul and repair work on Navy ships done by private-sector yards.

Potential Areas Of Concern. Potential areas of concern regarding the adequacy of the Navy's FY2007-FY2011 shipbuilding plan for supporting the

²⁹ These four yards are the Portsmouth Naval Shipyard at Portsmouth, NH/Kittery, ME; Norfolk Naval Shipyard at Norfolk, VA; Puget Sound Naval Shipyard at Bremerton, WA; and Pearl Harbor Naval Shipyard at Pearl Harbor, HI.

³⁰ The Avondale and Ingalls yards, together with a composite fabrication facility at Gulfport, MS, form Northrop Grumman Ship Systems (NGSS) division.

³¹ Austal USA was created in 1999 as a joint venture between Austal Limited of Henderson, Western Australia and Bender Shipbuilding & Repair Company of Mobile, AL. The Lockheed LCS team also includes GD/BIW as prime contractor, to provide program management and planning, to provide technical management, and to serve as "LCS system production lead,"

³² Bollinger operates about 15 shipyards and ship-related facilities in Louisiana and Texas, of which three, located in Lockport, LA, Gretna, LA, and Amelia, LA, are for building new ships.

shipbuilding industrial base, at least in its current form, include, among others, the following:

- whether the plan will include enough destroyers and cruisers, along with other forms of work, to support both of the two yards that in recent years have built all of the Navy's larger surface combatants — GD/BIW and NG/Ingalls;
- whether the plan will include enough submarine design and engineering work to maintain the submarine design and engineering base, which, for the first time in more than 40 years, has no new submarine-design program in progress; and
- whether the plan will provide enough work to maintain certain supplier firms, particularly firms that are sole sources for what they provide the Navy and whose financial health is largely dependent on the amount of work they receive from the Navy.

Debate On Number Of Shipyards Needed. Following the decline in the early 1990s in the rate of annual Navy ship procurement, some observers have questioned whether the shipbuilding industrial base should be maintained in its current form, and in particular, whether there should be a consolidation in the number of shipyards involved in building and repairing Navy ships.³³ They argue that there is considerable excess capacity across these yards, and consequently an excess amount of fixed overhead costs being added into the cost of Navy ships. Supporters of the industrial base in its current form argue that consolidating work into a smaller number of yards would reduce the Navy's ability to use competition or benchmarking in Navy ship design and construction, to respond to a natural disaster or terrorist attack at one or more of the yards, and to rapidly increase ship-production rates if needed to respond to a change in the international security climate.

³³ See, for example, John Shephard Jr. and Harvey Sapolsky, "Five Shipyards Too Many," *Washington Post*, November 8, 2005: 19.

Legislative Activity

FY2006

FY2006 Defense Authorization (H.R. 1815/S. 1042).

House. Section 128 of the FY2006 defense authorization bill (H.R. 1815) as reported by the House Armed Services Committee (H.Rept. 109-89 of May 20, 2005) states:

SEC. 128. AIRCRAFT CARRIER FORCE STRUCTURE.

(a) Requirement for 12 Operational Aircraft Carriers Within the Navy- Section 5062 of title 10, United States Code, is amended —

(1) by redesignating subsections (b) and (c) as subsections (c) and (d), respectively; and

(2) by inserting after subsection (a) the following new subsection (b):
 “(b) The naval combat forces of the Navy shall include not less than 12 operational aircraft carriers. For purposes of this subsection, an operational aircraft carrier includes an aircraft carrier that is temporarily unavailable for worldwide deployment due to routine or scheduled maintenance or repair.”

(b) U.S.S. John F. Kennedy-

(1) FULLY MISSION CAPABLE STATUS- The Secretary of Defense shall take all necessary actions to ensure that the U.S.S. John F. Kennedy (CVN-67) is maintained in a fully mission capable status.

(2) MAINTENANCE- From the amounts provided under section 301 for operation and maintenance of the Navy for fiscal year 2006, \$60,000,000 is authorized for the operation and routine maintenance of the U.S.S. John F. Kennedy.

Senate. Section 321 of the FY2006 defense authorization bill (S. 1042) as reported by the Senate Armed Services Committee (S.Rept. 109-69 of May 17, 2005) states:

SEC. 321. AIRCRAFT CARRIERS.

(a) FUNDING FOR REPAIR AND MAINTENANCE OF U.S.S. JOHN F. KENNEDY- Of the amounts authorized to be appropriated for operation and maintenance for the Navy by this Act and any other Act for fiscal year 2005 and 2006, \$288,000,000 shall be available only for repair and maintenance to extend the life of U.S.S. John F. Kennedy.

(b) LIMITATION ON REDUCTION IN NUMBER OF ACTIVE AIRCRAFT CARRIERS-

(1) LIMITATION- The Secretary of the Navy may not reduce the number of active aircraft carriers of the Navy below 12 active aircraft carriers until the later of the following:

(A) The date that is 180 days after the date of the submittal to Congress of the quadrennial defense review required in 2005 under section 118 of title 10, United States Code.

(B) The date on which the Secretary of Defense, in consultation with the Chairman of the Joint Chiefs of Staff, certifies to the congressional defense committees that such agreements have been entered into to provide port facilities for the permanent forward deployment of such number of aircraft carriers as is necessary in the Pacific Command Area of Responsibility to fulfill the roles and missions of that Command, including agreements for the forward deployment of a nuclear aircraft carrier after the retirement of the current two conventional aircraft carriers.

(2) **ACTIVE AIRCRAFT CARRIERS**- For purposes of this subsection, an active aircraft carrier of the Navy includes an aircraft carrier that is temporarily unavailable for worldwide deployment due to routine or scheduled maintenance.

In connection with this provision, S.Rept. 109-69 states:

The committee is concerned that the Navy's decision to reduce the number of aircraft carriers from 12 to 11 was not based on careful and thorough analysis, but rather was budget-driven. In testimony before the Committee on Armed Services in February 2005, the Chief of Naval Operations testified that when he first submitted the proposed Navy budget for fiscal year 2006, it included 12 aircraft carriers. Further, the last two Quadrennial Defense Reviews, in 1997 and 2001, both supported a force structure of 12 aircraft carriers. The reduction to 11 aircraft carriers was made after the Office of Management and Budget directed a budget cut for the Department of Defense.

The committee is also aware of the importance of permanent forward deployment of at least one aircraft carrier in the PACOM AOR. The USS Kitty Hawk, permanently forward deployed in Yokosuka, Japan, is scheduled for retirement in fiscal year 2008. The only other conventionally-powered aircraft carrier is the USS John F. Kennedy. The USS John F. Kennedy was scheduled to begin a complex overhaul (COH) maintenance period in fiscal year 2005, and funds for this COH were authorized and appropriated in fiscal year 2005 for this purpose. The ongoing Integrated Global Presence and Basing Strategy review might also expand the permanent forward deployment requirements for aircraft carriers, particularly in the PACOM AOR.

The committee believes it is prudent for the USS John F. Kennedy to receive its COH and that 12 aircraft carriers remain in the U.S. Navy until such time as an in-depth analysis is conducted and forward-basing agreements are reached.

S.Rept. 109-69 also states:

The committee is particularly concerned about the state of the current shipbuilding program. The committee does not believe that the current or projected level of funding for shipbuilding is adequate to build the numbers of ships that will allow the Navy to perform its global missions or to sustain an increasingly fragile industrial base. The founding fathers were specific in the United States Constitution that it is the duty of Congress to "maintain" a Navy. They had the foresight to realize that a Navy cannot be quickly constituted, or reconstituted. That is as true today as it was over two centuries ago. If the United States is to remain a global power, it must have a global presence. As a

maritime nation, that presence is often displayed in the form of naval ships, not only through ensuring open sea lines of communication and trade in international waters, but also through the inherently diplomatic mission of visiting foreign ports and “showing the flag.”

The Navy currently has only 288 ships in the fleet. This is the smallest number of ships in the Navy since before the start of the Second World War. It is true that these ships possess capabilities far greater than those of the past, but global presence demands sufficient numbers of ships as well as the capabilities possessed by those ships.

Numerous officials have testified before this committee that shipbuilding must become a subject of national debate. They have testified that the Department of Defense, the Congress, and the shipbuilders need to engage in this debate. Low shipbuilding rates have resulted in increased costs for ships, as recently documented by the Government Accountability Office. These increased costs have translated into even lower shipbuilding rates. The committee believes this downward spiral needs to be reversed. To accomplish this, the committee believes that significantly higher funding is required in the shipbuilding budget. That funding must be stable, and some degree of flexibility is required in the funding mechanisms for shipbuilding to allow for efficient management while visibility remains to allow for sufficient oversight.

The committee believes that the shipbuilding budget must be reviewed by the administration as a matter of the utmost urgency in the coming year. The committee recommends that the President consider establishing a special shipbuilding fund, which would be funded apart from the normal give and take within the Department of Defense budget process, to dedicate a sustained amount of funding for the construction of naval ships. The Congressional Budget Office estimates, based on testimony before the committee, that the amount of funding necessary to maintain a Navy of appropriate size and capability to deter any potential adversaries and meet U.S. global commitments is at least \$15.0 billion a year, and that it needs to be sustained at that level for a period of 10 to 15 years. (Pages 6-7)

Conference Report. Section 126 of the conference report on H.R. 1815 amends 10 USC 5062 to require that the Navy shall include not less than 12 operational aircraft carriers. The provision states:

SEC. 126. AIRCRAFT CARRIER FORCE STRUCTURE.

(a) Requirement for 12 Operational Aircraft Carriers Within the Navy. — Section 5062 of title 10, United States Code, is amended —

(1) by redesignating subsections (b) and (c) as subsections (c) and (d), respectively; and

(2) by inserting after subsection (a) the following new subsection (b):

“(b) The naval combat forces of the Navy shall include not less than 12 operational aircraft carriers. For purposes of this subsection, an operational aircraft carrier includes an aircraft carrier that is temporarily unavailable for worldwide deployment due to routine or scheduled maintenance or repair.”.

(b) Funding for Repair and Maintenance of U.S.S. John F. Kennedy. — Of the amounts available for operation and maintenance for the Navy pursuant to this Act and any other Act for fiscal year 2006, not more than \$288,000,000 shall be available for repair and maintenance to extend the life of the U.S.S. John F. Kennedy (CVN-67).

FY2006 Defense Appropriation (H.R. 2863).

House. In its report (H.Rept. 109-119 of June 10, 2005) on H.R. 2863, the House Appropriations Committee stated:

The Committee remains concerned over the continued instability in Navy's shipbuilding program. In last year's report, the Committee wrote:

"The Committee remains deeply troubled by the lack of stability in the Navy's shipbuilding program. Often both the current and outyear ship construction profile is dramatically altered with the submission of the next budget request. Programs justified to Congress in terms of mission requirements in one year's budget are removed from the next. The continued shifting of the shipbuilding program promotes confusion and frustration throughout both the public and private sectors."

Unfortunately, the fiscal year 2006 budget creates even more instability and uncertainty than in the recent past. The President's budget for fiscal year 2006 includes funds for only 4 new ships, (and only 2 under the SCN appropriation). This is one-half the number funded in fiscal year 2005. However, the long-term Navy plan suggests that, in only three years, the shipbuilding program will be up to 9 ships with an annual budget of almost \$14 billion. By the end of the Future Years Defense Program (FYDP), the Navy projects almost \$18 billion a year for 12 ships. The Committee believes that not only does fiscal year 2006 constitute a dangerous "notch" in the shipbuilding plan, but the outyear plan appears unrealistic. To more effectively address these issues, the Committee directs the Navy to submit to the congressional defense committees a ten-year shipbuilding plan, not later than the date of submission of the fiscal year 2007 President's budget. This plan should include total program quantities required, unit and budget costs assumed, and an assessment of technological risks remaining in each new design class. The plan should include new construction vessels funded in Research, Development, Test, and Evaluation, Navy, the National Defense Sealift Fund, and the Shipbuilding and Conversion, Navy appropriation. (Page 144; italics as in the original)

Senate. In its report (S.Rept. 109-141 of September 29, 2005) on H.R. 2863, the Senate Appropriations Committee stated:

The Committee remains gravely concerned about the overall health and stability of Navy shipbuilding. Fleet inventory and capability requirements remain unstable as do program performance and costs.

Of primary concern are soaring cost overruns. The Committee finds unanticipated cost overruns to be the root cause of much of the instability in the program. Until budget estimates become more realistic, requirements stabilize and penalties for exorbitant cost overruns are exercised, ship construction costs are unlikely to improve. The Committee is aware that the new Chief of Naval

Operations [CNO] is actively reviewing shipbuilding programs and is considering several options for controlling long-term costs. (Page 126)

National Naval Force Structure Policy Act (H.R. 375). This identical bills would establish it as “the policy of the United States to rebuild as soon as possible the size of the fleet of the United States Navy to no fewer than 375 vessels in active service, to include 15 aircraft carrier battle groups and 15 amphibious ready groups....” This 375-ship fleet would differ in structure from the Navy’s 375-ship proposal of 2002-2004, which included 12 carriers and about 12 amphibious ready groups. Similar legislation was introduced in the 108th Congress (H.R. 375/S. 902).

Bills On Aircraft Carrier Force Levels (H.R. 304/S. 145). These identical bills would amend Section 5062 of title 10 of the U.S. Code to state that “The naval combat forces of the Navy shall include not less than 12 operational aircraft carriers. For the purposes of this subsection, an operational aircraft carrier includes an aircraft carrier that is temporarily unavailable for worldwide deployment due to routine or scheduled maintenance or repair.”

FY2005

FY2005 Emergency Supplemental (H.R. 1268).

Conference Report. The conference report (H.Rept. 109-72 of May 3, 2005) on H.R. 1268, the Emergency Supplemental Appropriations Act for FY2005, contains a provision (Section 1025) stating:

AIRCRAFT CARRIERS OF THE NAVY

SEC. 1025. (a) **FUNDING FOR REPAIR AND MAINTENANCE OF U.S.S. JOHN F. KENNEDY-** Of the amount appropriated to the Department of the Navy in this Act, necessary funding will be made available for such repair and maintenance of the U.S.S. John F. Kennedy as the Navy considers appropriate to extend the life of U.S.S. John F. Kennedy.

(b) **LIMITATION ON REDUCTION IN NUMBER OF ACTIVE AIRCRAFT CARRIERS-** No funds appropriated or otherwise made available in this Act may be obligated or expended to reduce the number of active aircraft carriers of the Navy below 12 active aircraft carriers until after the date of the submittal to Congress of the quadrennial defense review required in 2005 under section 118 of title 10, United States Code.

(c) **ACTIVE AIRCRAFT CARRIERS-** For purposes of this section, an active aircraft carrier of the Navy includes an aircraft carrier that is temporarily unavailable for worldwide deployment due to routing or scheduled maintenance.

(d) **PACIFIC FLEET AUTHORITIES-** None of the funds available to the Department of the Navy may be obligated to modify command and control relationships to give Fleet Forces Command administrative and operational control of U.S. Navy forces assigned to the Pacific fleet: Provided, That the command and control relationships which existed on October 1, 2004 shall remain in force unless changes are specifically authorized in a subsequent act.

Note that subsection (a) does not specify the amount of funding that is to be made available for repair and maintenance of the Kennedy, and that subsection (b) relates specifically to the obligation and expenditure of funds made available “in this Act,” meaning H.R. 1268. Subsection (b) does not appear to prevent the Navy from obligating or expending funds appropriated or otherwise made available by other Acts, such as the regular FY2005 DOD appropriation act (P.L. 108-287 of August 5, 2005), to reduce the number of active carriers to something less than 12, even while the Navy performs repair and maintenance work on the Kennedy. The Navy in the past has sometimes performed repair and maintenance work on ships prior to deactivating them and putting them into preservation (“mothball”) status, so that the ships could be more easily reactivated at some point in the future. Subsection (d), unlike subsection (b), does not contain the words “in this Act.”

Floor Amendments To Earlier Senate Version. Prior to the conference on H.R. 1268, the Senate on April 20, 2005, passed, 58-38 (Record Vote Number 106), an amendment (S.Amdt. 498) to the Senate version of H.R. 1268, which stated:

AIRCRAFT CARRIERS OF THE NAVY

SEC. 1122. (a) FUNDING FOR REPAIR AND MAINTENANCE OF U.S.S. JOHN F. KENNEDY. — Of the amount appropriated to the Department of the Navy by this Act, necessary funding will be made available for such repair and maintenance of the U.S.S. John F. Kennedy as the Navy considers appropriate to extend the life of U.S.S. John F. Kennedy.

(b) LIMITATION ON REDUCTION IN NUMBER OF ACTIVE AIRCRAFT CARRIERS. — No funds appropriated or otherwise made available by this Act may be obligated or expended to reduce the number of active aircraft carriers of the Navy below 12 active aircraft carriers until the later of the following:

(1) The date that is 180 days after the date of the submittal to Congress of the quadrennial defense review required in 2005 under section 118 of title 10, United States Code.

(2) The date on which the Secretary of Defense, in consultation with the Chairman of the Joint Chiefs of Staff, certifies to Congress that such agreements have been entered into to provide port facilities for the permanent forward deployment of such numbers of aircraft carriers as are necessary in the Pacific Command Area of Responsibility to fulfill the roles and missions of that Command, including agreements for the forward deployment of a nuclear aircraft carrier after the retirement of the current two conventional aircraft carriers.

(c) ACTIVE AIRCRAFT CARRIERS. — For purposes of this section, an active aircraft carrier of the Navy includes an aircraft carrier that is temporarily unavailable for worldwide deployment due to routing or scheduled maintenance.

A similar amendment, S.Amdt. 499, was ruled non-germane by the chair. S.Amdt 499 stated:

AIRCRAFT CARRIERS OF THE NAVY

SEC. 1122. (a) FUNDING FOR REPAIR AND MAINTENANCE OF U.S.S. JOHN F. KENNEDY. — Of the amount appropriated to the Department of the Navy by this Act, and by the Department of Defense Appropriations Act, 2005 (Public Law 108-287; 118 Stat. 954), an aggregate of \$288,000,000 may be available only for repair and maintenance of the U.S.S. John F. Kennedy, and available to conduct such repair and maintenance of the U.S.S. John F. Kennedy as the Navy considers appropriate to extend the life of U.S.S. John F. Kennedy.

(b) LIMITATION ON REDUCTION IN NUMBER OF ACTIVE AIRCRAFT CARRIERS. — No funds appropriated or otherwise made available by this Act, or any other Act, may be obligated or expended to reduce the number of active aircraft carriers of the Navy below 12 active aircraft carriers until the later of the following:

(1) The date that is 180 days after the date of the submittal to Congress of the quadrennial defense review required in 2005 under section 118 of title 10, United States Code.

(2) The date on which the Secretary of Defense, in consultation with the Chairman of the Joint Chiefs of Staff, certifies to Congress that such agreements have been entered into to provide port facilities for the permanent forward deployment of such numbers of aircraft carriers as are necessary in the Pacific Command Area of Responsibility to fulfill the roles and missions of that Command, including agreements for the forward deployment of a nuclear aircraft carrier after the retirement of the current two conventional aircraft carriers.

(c) ACTIVE AIRCRAFT CARRIERS. — For purposes of this section, an active aircraft carrier of the Navy includes an aircraft carrier that is temporarily unavailable for worldwide deployment due to routing or scheduled maintenance.

Differences between the two amendments include the wording of subsection (a) and the absence in S.Amdt. 498 of the phrase “or any other Act” in subsection (b). The absence of the phrase “or any other Act” from S.Amdt. 498 raised the possibility that funds appropriated in P.L. 108-287 could be used to reduce the Navy’s carrier force from 12 ships to 11, even while the Navy performs repair and maintenance work on the Kennedy.

S.Amdt 265. An earlier amendment to H.R. 1268, S.Amdt. 265, introduced on April 4, 2005 and referred to the Committee on Appropriations, would add a provision stating:

(a) PROHIBITION. — No funds appropriated or otherwise made available by this Act, or by any other Act, for fiscal year 2005 may be obligated or expended to reduce the number of operational aircraft carriers of the Navy from 12 operational aircraft carriers to 11 operational aircraft carriers.

(b) OPERATIONAL AIRCRAFT CARRIER. — In this section, the term “operational aircraft carrier” includes an aircraft carrier that is unavailable due to maintenance or repair.

FY2005 Defense Authorization Act (H.R. 4200/P.L. 108-375). Section 1014 of the conference report (H.Rept. 108-767 of October 8, 2004) on H.R. 4200/P.L. 108-375 of October 28, 2004) states:

SEC. 1014. INDEPENDENT STUDY TO ASSESS COST EFFECTIVENESS OF THE NAVY SHIP CONSTRUCTION PROGRAM.

(a) **STUDY.** — The Secretary of Defense shall provide for a study of the cost effectiveness of the ship construction program of the Navy. The study shall be conducted by a group of industrial experts independent of the Department of Defense. The study shall examine both —

- (1) a variety of approaches by which the Navy ship construction program could be made more efficient in the near term; and
- (2) a variety of approaches by which, with a nationally integrated effort over the next decade, the United States shipbuilding industry might enhance its health and viability.

(b) **NEAR-TERM IMPROVEMENTS IN EFFICIENCY.** — With respect to the examination under subsection (a)(1) of approaches by which the Navy ship construction program could be made more efficient in the near term, the Secretary shall provide for the persons conducting the study to —

- (1) determine the potential cost savings on an annual basis, with an estimate of return on investment, from implementation of each approach examined; and
- (2) establish priorities for potential implementation of the approaches examined.

(c) **UNITED STATES SHIPBUILDING INFRASTRUCTURE MODERNIZATION PLAN.** — With respect to the examination under subsection (a)(2) of approaches by which the United States shipbuilding industry might enhance its health and viability through a nationally integrated effort over the next decade, the Secretary shall provide for the persons conducting the study to —

- (1) propose a plan incorporating a variety of approaches that would modernize the United States shipbuilding infrastructure within the next decade, resulting in a healthier and more viable shipbuilding industrial base;
- (2) establish priorities for potential implementation of the approaches examined; and
- (3) estimate the resources required to implement each of the approaches examined.

(d) **REPORT.** — Not later than October 1, 2005, the Secretary of Defense shall submit a report to the congressional defense committees providing the results of the study under subsection (a). The report shall include the matters specified in subsections (b) and (c).

In discussing this provision, the conference report stated:

The House bill contained a provision (sec. 1012) that would require the Secretary of Defense to have a study conducted by an entity independent of the Department of Defense on the cost-effectiveness of the ship construction program of the Navy. The study would examine various approaches for how the Navy ship construction program could be made more cost-effective in the near-term, and how the United States shipbuilding industry might be made globally competitive through a nationally integrated effort over the next decade.

The Senate amendment contained no similar provision.

The Senate recedes with an amendment that would require the Secretary of Defense to provide for a group of industrial experts to assess priorities for potential implementation of the various approaches in the near-term study, with an assessment of the return on investment. It would also require an assessment of priorities for potential implementation of the various approaches for the nationally, integrated effort, with the objective being to create a healthier and more viable U.S. shipbuilding industrial base.

The conferees believe the group chosen for this study should be five to ten industrial experts who represent an array of industrial sectors, not just the shipbuilding industry. Many sectors of the U.S. industrial base have had to retool processes and equipment to become more competitive. Since the rate of shipbuilding is much lower, competitiveness has not provided the same incentive for this sector. The conferees are aware of and support the work of the National Shipbuilding Research Program-Advanced Shipbuilding Enterprise (NSRP — ASE), including its lean shipbuilding initiative. The conferees would expect the group of industrial experts chosen for this study to become familiar with this work, and to consider the potential for using the NSRP — ASE to implement some of the various approaches. (Pages 755-756)

In its discussion of a proposed ballistic missile defense interceptor called the kinetic energy interceptor (KEI), which could be both ground- and sea-based, the conference report stated:

The conferees remain convinced that the KEI could be an important aspect of the overall ballistic missile defense architecture, potentially contributing intercept capabilities in boost, midcourse, and terminal phases of the threat missile flight. The conferees are concerned, however, with the lack of progress in defining basing modes. The conferees note that:

(1) Recent justifications for the KEI ground-based variant suggest that it might serve as the basis for midcourse intercept capability in Europe. At the same time, however, the budget request included \$35.0 million for additional ground-based interceptors (GBI) for the ground-based midcourse defense element that could be deployed in Europe; and

(2) Consideration of sea-based concepts of operations and platforms do not appear to be progressing.

The conferees direct the Director of the Missile Defense Agency to provide a report to the congressional defense committees by February 1, 2005 that includes planned ground- and sea-basing modes for KEI (including specific sea-based platforms) and the concept of operations for each basing mode; how KEI will enhance ballistic missile defense system capabilities; the role KEI may play in European missile defense and how that role relates to the fielding of additional GBIs ground-based interceptors); and a comparison of anticipated sea-based KEI capabilities with other sea-based missile defense options. (Pages 579-580)

FY2004

FY2004 Defense Authorization Act (H.R. 1588/P.L. 108-136). Section 216 of the conference report (H.Rept. 108-354 of November 7, 2003) on the FY2004 defense authorization bill (H.R. 1588/P.L. 108-136 of November 24, 2003) requires the Secretary of Defense to provide for two independently performed studies on potential future fleet platform architectures (i.e., potential force structure plans) for the Navy. The two studies, which are being conducted by the Center for Naval Analyses (CNA) and the Office of Force Transformation (or OFT, a part of the Office of the Secretary of Defense), are to be submitted to the congressional defense committees by January 15, 2005. (See pages 28-29 and 612-613 of H.Rept. 108-354.)³⁴

³⁴ Section 216 is an amended version of a provision (Section 217) in the House-reported version of H.R. 1588. See H.Rept. 108-106, May 16, 2003, pp. 255-256.

Appendix A: Previous Ambiguity In Navy Ship Force-Structure Planning

This appendix reviews ambiguity in Navy ship force-structure planning prior to the Navy's reported 313-ship proposal.

310-Ship Plan From 2001 QDR

Until the Navy's reported 313-ship proposal, the last unambiguous ship force structure plan for the Navy that was officially approved and published by the Office of the Secretary of Defense (OSD) appeared in the September 2001 report on the 2001 Quadrennial Defense Review (QDR). This plan, like the one approved in the 1997 QDR, included 12 aircraft carriers, 116 surface combatants, 55 nuclear-powered attack submarines (SSNs),³⁵ and 36 amphibious ships organized into 12 amphibious ready groups (ARGs) with a combined capability to lift the assault echelons of 2.5 Marine Expeditionary Brigades (MEBs).³⁶ Although the 2001 QDR report did not mention a total number of ships, this fleet was generally understood to include a total of about 310 battle force ships.³⁷ The 2001 QDR report also stated that as DOD's "transformation effort matures — and as it produces significantly higher output of military value from each element of the force — DOD will explore additional opportunities to restructure and reorganize the Armed Forces."³⁸

Following the publication of the 2001 QDR report, the Navy took steps which had the effect of calling into question the status of the 310-ship plan. In November 2001, the Navy announced a plan for procuring a new kind of small surface combatant, called the Littoral Combat Ship (LCS), that the Navy had not previously planned to procure, and which was not mentioned in the 2001 QDR report.³⁹ And in

³⁵ The plan approved in the 1997 QDR originally included 50 SSNs but was subsequently amended to include 55 SSNs.

³⁶ U.S. Department of Defense, *Quadrennial Defense Review Report*, Washington, 2001, p. 22.

³⁷ Since the beginning of the Reagan Administration, the total number of ships in the Navy has been calculated using the battle force method of counting ships. Battle force ships are ships that are readily deployable and which contribute directly or indirectly to the deployed combat capability of the Navy. Battle force ships include active-duty Navy ships, Naval Reserve Force ships, and ships operated by the Military Sealift Command that meet this standard. The total number of battle force ships includes not only combat ships but also auxiliary and support ships — such as oilers, ammunition ships, and general stores ships — that transport supplies to deployed Navy ships operating at sea. The total number of battle force ships does not include ships in reduced readiness status that are not readily deployable, ships and craft that are not generally intended for making distant deployments, oceanographic ships operated by the National Oceanic and Atmospheric Administration (NOAA), and DOD sealift and prepositioning ships that transport equipment and supplies (usually for the benefit of the Army or Air Force) from one land mass to another.

³⁸ *Quadrennial Defense Review Report*, op. cit., p. 23.

³⁹ For more on the LCS program, see CRS Report RS21305, *Navy Littoral Combat Ship* (continued...)

February 2003, in submitting its proposed FY2004-FY2009 Future Years Defense Plan (FYDP) to Congress, DOD announced that it had initiated studies on undersea warfare requirements and forcible entry options for the U.S. military. These studies could affect, among the other things, the required numbers of SSNs and amphibious ships. The 310-ship plan is now rarely mentioned by Navy and DOD officials.

Navy 375-Ship Proposal Of 2002-2004

Navy leaders in early 2002 began to mention an alternative proposal for a 375-ship Navy that initially included 12 aircraft carriers, 55 SSNs, 4 converted Trident cruise-missile-carrying submarines (SSGNs), 160 surface combatants (including 104 cruisers, destroyers, frigates, and 56 LCSs), 37 amphibious ships, and additional mine warfare and support ships.⁴⁰

Although Navy leaders routinely referred to the 375-ship proposal from about February 2002 through about February 2004, Secretary of Defense Donald Rumsfeld, at a February 5, 2003, hearing before the House Armed Services Committee, explicitly declined to endorse it as an official DOD goal, leaving it a Navy proposal only.

In April 2004, Navy leaders began to back away from the 375-ship proposal, stating that 375 was an approximate figure, that the ships making up the total of 375 were subject to change, and perhaps most important, that the 375-ship figure reflected traditional concepts for crewing and deploying Navy ships, rather than new concepts — such as Sea Swap — that could significantly reduce future requirements for Navy ships.

Early-2005 Navy Proposal For Fleet Of 260 To 325 Ships

At a February 10, 2005 hearing before the Senate Armed Services Committee on the proposed FY2006 DOD budget and FY2006-FY2011 FYDP, Admiral Vernon Clark, the Chief of Naval Operations, testified that the Navy in future years may require a total of 260 to 325 ships, or possibly 243 to 302 ships, depending on how much the Navy uses new technologies and Sea Swap. Specifically, Clark stated:

As we evolve advanced concepts for employment of forces, we will also refine analyses and requirements, to include the appropriate number of ships, aircraft, and submarines....

³⁹ (...continued)

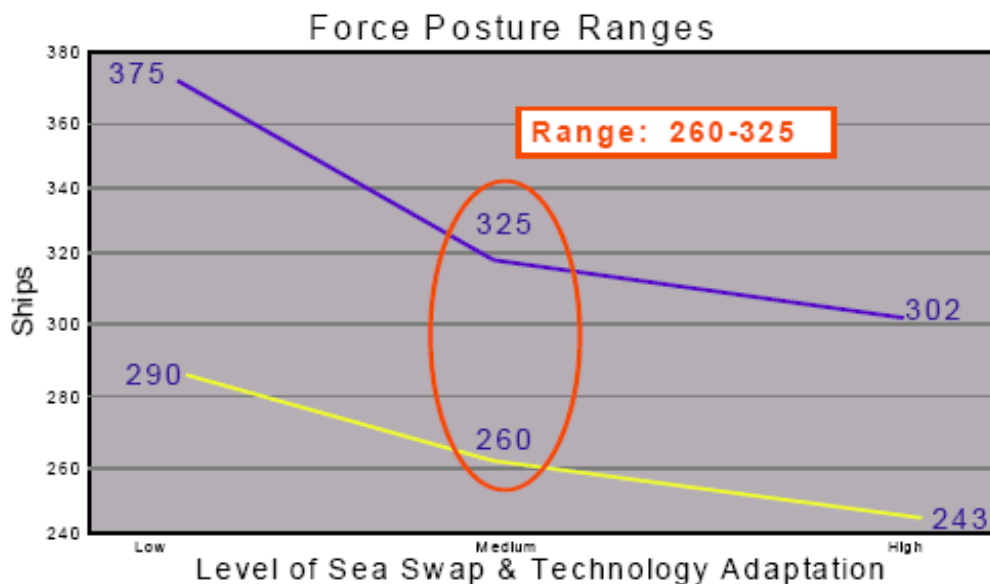
(LCS): *Background and Issues for Congress*, by Ronald O'Rourke; and CRS Report RL32109, *Navy DD(X) and LCS Ship Acquisition Programs: Oversight Issues and Options for Congress*, by Ronald O'Rourke.

⁴⁰ The composition of the plan was subsequently modified to include 12 aircraft carriers, 52 SSNs, 4 SSGNs, 165 surface combatants (109 cruisers and destroyers and 56 LCSs), 36 amphibious ships, 18 Maritime Prepositioning Force (Future) ships, and additional mine warfare and support ships.

In a sensor-rich construct, the numbers of platforms are no longer a meaningful measure of combat capability. And just as the number of people is no longer the primary yardstick by which we measure the strength or productivity of an organization in an age of increasing capital-for-labor substitutions, the number of ships is no longer adequate to gauge the health or combat capability of the Navy. The capabilities posture of the Fleet is what is most important. In fact, your Navy can deliver much more combat power, more quickly now than we could twenty years ago when we had twice as many ships and half again as many people....

Further, I believe that the current low rate of ship construction and the resultant escalation of platform cost will constrain the future size of the Fleet. As I have previously testified, I don't believe that it's all about numbers; numbers have a quality all their own, there's no question about that. But, it is more important that we buy the right kinds of capabilities in the ships that we're procuring in the future, and that we properly posture our force to provide the speed and agility for seizing and retaining the initiative in any fight.

The ultimate requirement for shipbuilding, however, will be shaped by the potential of emerging technologies, the amount of forward basing, and innovative manning concepts such as Sea Swap. Additional variables range from operational availability and force posture to survivability and war plan timelines.



The notional diagram [above] illustrates how manning concepts and anticipated technological adaptation will modify the number of ships required. The [upper and lower] lines represent levels of combat capability and the ships required to achieve that capability. For example, the left side of the diagram shows our current number of ships (290) and the current projection of ships required to fully meet Global War on Terror requirements (375) in the future. The right side of the diagram shows a projection that provides the same combat capability but fully leverages technological advances with maximum use of Sea Swap. It is a range of numbers because the degree of technological adaptation is a variable, as is the degree to which we can implement Sea Swap. The middle portion of the curve [in the ellipse] shows a projected range that assumes a less extensive projection of technological adaptation and use of Sea swap. Although simplified,

this diagram shows how the application of transformational new technologies coupled with new manning concepts will enable us to attain the desired future combat capability with a force posture between 260 and 325 ships.⁴¹

Admiral Clark's testimony did not detail the compositions of these fleets by ship type or make clear whether any of these potential total ship figures have been endorsed by the Secretary of Defense as official DOD force-structure planning goals.

In March 2005, the Navy provided a report to Congress showing the notional compositions of 260- and 325-ship fleets in FY2035.⁴² **Table 1** below compares the 310-ship plan from the 2001 QDR and the Navy's 375-ship proposal of 2002-2004 with the notional 260- and 325-ship fleets from the March 2005 Navy report to Congress.

Using the 260-ship fleet as a baseline, the range of 260 to 325 ships equates to a 25% range of variability in the potential total number of ships. For some ship categories — such as SSBNs and SSGNs — there is little or no difference between the 260- and 325-ship fleets. For other categories of ships, there are substantial percentage ranges of variability — 37% for cruisers, destroyers and frigates, 30% for LCSs; 41% for amphibious ships; and 43% for maritime prepositioning ships. For the remaining categories of ships — attack submarines, aircraft carriers, combat logistics ships, and other ships — the ranges of variability are 10% or less. In the case of aircraft carriers, the one-ship difference under two fleet plans can translate into a substantial difference in Navy funding requirements and shipbuilding work.

When asked why the Navy has not expressed its force-level requirements as a single figure, as it has in the past, or as a more tightly focused range, Navy officials have stated that additional analyses need to be performed to tighten the range, that some of the variability is due to the Navy's inability to predict the future with precision, and that the Navy needs to work to refine these figures further to establish a more stable set of requirements for ships.⁴³

Capabilities-Based Planning and Numbers of Ships

As suggested in Admiral Clark's February 2005 testimony, DOD in recent years has altered the basis of its force planning, shifting from threat-based planning to capabilities-based planning. Under threat-based planning, DOD planned its forces

⁴¹ Source for quoted text and associated diagram: Statement of Admiral Vernon Clark, USN, Chief of Naval Operations, Before the Senate Armed Services Committee, Feb. 10, 2005, pp. 17-19.

⁴² U.S. Department of the Navy, *An Interim Report to Congress on Annual Long-Range Plan For The Construction Of Naval Vessels For FY 2006*. The report was delivered to the House and Senate Armed Services Committees on March 23, 2005. Copies of the report were obtained by defense trade publications, and at least one of these publications posted the report on its website.

⁴³ See, for example, Geoff Fein, "Navy Needs To Better Refine Shipbuilding Numbers, Says Sestak," *Defense Daily*, Mar. 30, 2005; and Dave Ahearn, "Adm. Sestak Says Future Shipbuilding Needs Must Be Flexible," *Defense Today*, Mar. 30, 2005.

based on what would be needed for conflict scenarios that were defined fairly specifically. During the Cold War, for example, DOD planned forces that would be sufficient, in conjunction with allied NATO forces, for fighting a multi-theater conflict with the Soviet Union and its Warsaw Pact allies. Similarly, in the first few years of the post-Cold War era, DOD planned forces that would be sufficient for, among other things, fighting two nearly simultaneous regional conflicts, one in the Persian Gulf region, the other on the Korean peninsula.

Under capabilities-based planning, DOD is now planning for U.S. military forces to have a variety of abilities, so that they will be better able to respond to a wide array of possible conflict scenarios. DOD officials have explained that the shift to capabilities-based planning responds to the difficulty of predicting, in today's security environment, specific future threats and warfighting scenarios.

When asked about required numbers of Navy ships and aircraft, Navy and DOD officials have argued, as Admiral Clark does in the above-cited testimony, that under capabilities-based planning, numbers of ships and aircraft per se are not as important as the total amount of capability represented in the fleet. That may be correct insofar as the policy objective is to have a Navy with a certain desired set of capabilities, and not simply one that happens to include a certain number of ships and aircraft. But that is not the same as saying that a Navy with a desired set of capabilities cannot in turn be described as one having certain numbers of ships and aircraft of certain types.

Although the Navy is currently working to resolve uncertainties concerning the applicability of new technologies the Sea Swap concept, it arguably should become possible at some point to translate a set of desired Navy into desired numbers of ships and aircraft. Those numbers might be expressed as focused ranges rather than specific figures, and these focused ranges may change over time as missions, technologies, and crewing concepts change. But to argue indefinitely that desired naval capabilities cannot be translated into desired numbers of ships and aircraft would be to suggest that the Navy cannot measure and understand the capabilities of its own ships and aircraft. In this sense, the shift to capability-based planning does not in itself constitute a rationale for permanently setting aside the question of the planned size and structure of the fleet.

Implications of Ambiguity in Navy Force-Structure Plans

For the Navy. For the Navy, ambiguity concerning required numbers of Navy ships provided time to resolve uncertainties concerning the applicability of new technologies and the Sea Swap concept to various kinds of Navy ships. Navy (and DOD) officials may also have found this ambiguity convenient because it permitted them to speak broadly about individual Navy ship-acquisition programs without offering many quantitative details about them — details which they might be held accountable to later, or which, if revealed now, might disappoint Members of Congress or industry officials.

This ambiguity may also, however, have made it difficult for Navy officials, in conversations with the Office of the Secretary of Defense (OSD), to defend programs for procuring Navy ships in certain total numbers or at certain annual rates because OSD officials might view alternative total numbers or annual rates as sufficient for

maintaining a Navy that falls somewhere within the broad ranges of total numbers of ships that Navy officials have presented in their testimony.

For Congress. Ambiguity concerning required numbers of Navy ships made it more difficult for Congress to conduct effective oversight by reconciling desired Navy capabilities with planned Navy force structure, and planned Navy force structure with supporting Navy programs and budgets. With the middle element of this oversight chain expressed in only general terms, it was more difficult for Congress to understand whether proposed programs and budgets will produce a Navy with DOD's desired capabilities. The defense oversight committees in recent years have criticized the Navy for presenting a confused and changing picture of Navy ship requirements and procurement plans.⁴⁴

For Industry. Ambiguity concerning required numbers of Navy ships may have made it easier for industry officials to pour into broad remarks from the Navy or DOD their own hopes and dreams for individual programs. This could have led

⁴⁴ For example, the conference report (H.Rept. 107-772) on the FY2003 defense authorization act (P.L. 107-314/H.R. 4546) stated:

In many instances, the overall Department of Defense ship acquisition message is confused.... The conferees also believe that the DON shares blame for this confusion because it has been inconsistent in its description of force structure requirements. This situation makes it appear as if the Navy has not fully evaluated the long-term implications of its annual budget requests....

The conferees perceive that DOD lacks a commitment to buy the number and type of ships required to carry out the full range of Navy missions without redundancy. The DON has proposed to buy more ships than the stated requirement in some classes, while not requesting sufficient new hulls in other classes that fall short of the stated requirement. Additionally, the conferees believe that the cost of ships will not be reduced by continually changing the number of ships in acquisition programs or by frequently changing the configuration and capability of those ships, all frequent attributes of recent DON shipbuilding plans. (Pages 449 and 450)

The House Appropriations Committee, in its report (H.Rept. 108-553) on the FY2005 DOD appropriations bill (H.R. 4613), stated:

The Committee remains deeply troubled by the lack of stability in the Navy's shipbuilding program. Often both the current year and out year ship construction profile is dramatically altered with the submission of the next budget request. Programs justified to Congress in terms of mission requirements in one year's budget are removed from the next. This continued shifting of the shipbuilding program promotes confusion and frustration throughout both the public and private sectors. Moreover, the Committee is concerned that this continual shifting of priorities within the Navy's shipbuilding account indicates uncertainty with respect to the validity of requirements and budget requests in support of shipbuilding proposals. (Page 164)

See also the Legislative Activity section of this report, particularly for comments in committee reports on the FY2006 defense authorization and appropriation bills.

to excessive industry optimism about those programs. Ambiguity concerning required numbers of Navy ships also made it more difficult for industry to make rational business-planning decisions in areas such as production planning, workforce management, facilities investment, company-sponsored research and development, and potential mergers and acquisitions.⁴⁵

⁴⁵ A July 2004 press article, for example, states that

Philip Dur, chief executive officer of Northrop Grumman's Shipbuilding Systems, argued that the Navy's concept of "capabilities versus numbers" not only would hurt the service's operations, but decimate the industry.

If the Navy decides it cannot afford 300 ships, it should come up with a smaller number and set new ship construction plans based on that number, Dur said.

It also would be helpful, he added, if both the Navy and the Coast Guard jointly planned their long-term shipbuilding buys. "I do not know that either service takes the other service's capabilities into account," he said. If both services set their shipbuilding goals collectively, "then the shipbuilders can lay out an investment plan, a hiring plan [and] a training plan that was predicated on the assumption that we would competing for an X-number of platforms per year on a going-forward basis," Dur said....

If the Department of Defense can frame a requirement for ships and defend it, the industry would make the necessary adjustments to either scale down or ramp up, Dur told reporters during a recent tour of the company's shipyards in Louisiana and Mississippi.

(Roxana Tiron, "Lack of Specificity in Navy Shipbuilding Plans Irks the Industry," *National Defense*, July 2004.)

Appendix B: Independent Studies On Navy Force Structure

Section 216 of the conference report (H.Rept. 108-354 of November 7, 2003) on the FY2004 defense authorization bill (H.R. 1588/P.L. 108-136 of November 24, 2003) required the Secretary of Defense to provide for two independently performed studies on potential future fleet platform architectures (i.e., potential force structure plans) for the Navy. The two studies, which were conducted by the Center for Naval Analyses (CNA) and the Office of Force Transformation (OFT, a part of the Office of the Secretary of Defense), were submitted to the congressional defense committees in February 2005.⁴⁶

A third independent study on potential future fleet platform architectures was conducted by the Center for Strategic and Budgetary Assessments (CSBA). CSBA conducted this study on its own initiative and made it available to congressional and other audiences in March 2005 as an alternative to the CNA and OFT studies.

This appendix summarizes and discusses these three studies.⁴⁷

Force Structure Recommendations

CNA Report.⁴⁸ The CNA report uses essentially the same kinds of ships and naval formations as those planned by the Navy. The report recommends a Navy force structure range of 256 to 380 ships. The low end of the range assumes a greater use of crew rotation and overseas homeporting of Navy ships than the high end. **Table 5** below compares the CNA-recommended force range to the Navy's 375-ship fleet proposal of 2002-2004 and the notional 260- and 325-ship fleets for FY2035 presented in the Navy's March 2005 interim report to Congress.

⁴⁶ Section 216 is an amended version of a provision (Section 217) in the House-reported version of H.R. 1588. See H.Rept. 108-354, pp.28-29, 612-613; and H.Rept. 108-106, May 16, 2003, pp.255-256.

⁴⁷ This appendix is adapted from a part of a statement made by the author before the Senate Armed Services Committee Subcommittee on Seapower, Hearing on Navy Capabilities and Force Structure, Apr. 12, 2005.

⁴⁸ Delwyn Gilmore, with contributions by Mark Lewellyn et al., *Report to Congress Regarding Naval Force Architecture*, Center for Naval Analyses, CRMD0011303.A2/1Rev, Jan. 2005.

Table 5. CNA-Recommended Force and Other Proposals

Ship type	CNA force range	Navy 375-ship proposal of 2002-2004 ^a	Notional Navy fleets for FY2035	
			260 ships	325 ships
Ballistic missile submarines (SSBNs)	14	14	14	14
Cruise missile submarines (SSGNs)	4	4	4	4
Attack submarines (SSNs)	38 to 62	52	37	41
Aircraft carriers	10 to 12	12	10	11
Cruisers and destroyers	66 to 112	109	67	92
Littoral combat ships (LCSs)	40 to 70	56	63	82
Amphibious ships	18 to 30	36	17	24
Maritime Prepositioning Force (Future) ships	19 to 21	18	14	20
Combat logistics (resupply) ships	25 to 33	33	24	26
Other ^b	22	41	10	11
Total battle force ships	256 to 380	375	260	325

Source: Table prepared by CRS based on CNA report and March 2005 Navy report.

- a. Composition as shown in CNA report as the program of record for 2022. An earlier and somewhat different composition is shown elsewhere in this CRS report.
- b. Includes command ships, support ships (such as salvage ships and submarine tenders), dedicated mine warfare ships, and sea basing connector ships.

OFT Report.⁴⁹ The OFT report employs eight new ship designs that differ substantially from the designs of most ships currently in the fleet, under construction, or planned for procurement. Among the eight new ship designs are four types of large surface ships that would be built from a common, relatively inexpensive, merchant-like hull design developed in 2004 for the Navy's Maritime Prepositioning Force (Future) analysis of alternatives. These four types of ships, which would all displace 57,000 tons, include:

- **An aircraft carrier** that would embark a notional air wing of 30 Joint Strike Fighters (JSFs), 6 MV-22 Osprey tilt-rotor aircraft, and 15 unmanned air vehicles (UAVs). The total of 36 manned aircraft is about half as many as in today's carrier air wings, and the OFT architecture envisages substituting two of these new carriers for each

⁴⁹ U.S. Department of Defense, Office of the Secretary of Defense, *Alternative Fleet Architecture Design* (Report for the Congressional Defense Committees, Office of Force Transformation). The OFT report was also published in slightly modified form as Stuart E. Johnson and Arthur K. Cebrowski, *Alternative Fleet Architecture Design*. Washington, National Defense University, 2005. 96 pp. (Defense & Technology Paper 19, Center for Technology and National Security, National Defense University, August 2005)

of today's carriers. This new carrier would also have support spaces for unmanned underwater vehicles (UUVs), unmanned surface vehicles (USVs), and mission modules for the 1,000-ton surface combatant described below.

- **A missile-and-rocket ship** that would be quipped with 360 vertical launch system (VLS) missile tubes and 4 trainable rocket launchers. Additional spaces on this ship could be used to support UUVs, USVs, and mission modules for the 1,000-ton surface combatant. Alternatively, these spaces could be used to provide limited stowage and working space for the 100-ton surface combatant described below, and mission modules for these 100-ton ships.
- **An amphibious assault ship** that would embark a notional air wing of either 30 CH-46 equivalents or 6 JSFs, 18 MV-22s, and 3 gyrocopter heavy-lift helicopters. It would also have spaces for Marine Corps equipment, unmanned vehicles, and mission modules for the 1,000-ton surface combatant.
- **A “mother ship” for small combatants** that would contain stowage and support spaces for the 100-ton surface combatant described below.

The four other new-design ships in the OFT architecture are:

- **A 13,500-ton aircraft carrier** based on a conceptual surface effect ship (SES)/catamaran hull design developed in 2001 by a team at the Naval Postgraduate School. This ship would embark a notional air wing of 8 JSFs, 2 MV-22s, and 8 UAVs. The total of 10 manned aircraft is roughly one-eighth as many as in today's carrier air wings, and the OFT architecture envisages substituting eight of these new carriers for each of today's carriers. This new ship would have a maximum speed of 50 to 60 knots.
- **A 1,000-ton surface combatant** with a maximum speed of 40 to 50 knots and standard interfaces for accepting various modular mission packages. These ships would self-deploy to the theater and would be supported in theater by one or more of the 57,000-ton ships described above.
- **A 100-ton surface combatant** with a maximum speed of 60 knots and standard interfaces for accepting various modular mission packages. These ships would be transported to the theater by the 57,000-ton mother ship and would be supported in theater by that ship and possibly also the 57,000-ton missile-and-rocket ship.
- **A non-nuclear-powered submarine** equipped with an air-independent propulsion (AIP) system. These AIP submarines would be lower-cost supplements to the Navy's nuclear-powered submarines (SSNs) and would be transported from home port to the

theater of operations by transport ships. The OFT architecture envisages substituting four of these submarines for the SSN in each carrier strike group.⁵⁰

The 1,000- and 100-ton surface combatants would be built as relatively inexpensive sea frames, like the LCS.

The OFT report combines these eight types of ships, plus the Navy's currently planned TAOE-class resupply ship, into a fleet that would include a much larger total number of ships than planned by the Navy, about the same number of carrier-based aircraft as planned by the Navy, and large numbers of unmanned systems. The OFT report presents three alternative versions of this fleet, which the report calls Alternatives A, B, and C. The report calculates that each of these alternatives would be equal in cost to the equivalent parts of the Navy's 375-ship proposal. Each of these alternative force structures, like the equivalent parts of the Navy's 375-ship proposal, would be organized into 12 carrier strike groups (CSGs), 12 expeditionary strike groups (ESGs), and 9 surface strike groups (SSGs). The three alternative force structures are shown in **Table 6** below.

Table 6. Alternative Fleet Structures from OFT Report

Ship type	Alternative		
	A	B	C
57,000-ton aircraft carrier	24	24	0
57,000-ton missile-and-rocket ship	33	33	33
57,000-ton amphibious assault ship	24	24	24
57,000-ton mother ship	0	24	24
13,500-ton aircraft carrier	0	0	96
1,000-ton surface combatant	417	0	0
100-ton surface combatant	0	609	609
AIP submarine	48	48	48
TAOE-class resupply ship	12	12	12
<i>Subtotal 1,000- and 100-ton ships</i>	<i>417</i>	<i>609</i>	<i>609</i>
<i>Subtotal other ships</i>	<i>141</i>	<i>165</i>	<i>237</i>
Total ships^a	558^a	774^a	846^a

Source: Table prepared by CRS based on figures in OFT report.

- a. The totals shown in early copies of the OFT report are 36 ships lower in each case due to an error in those copies in calculating the numbers of ships in the 12 carrier strike groups.

⁵⁰ The report states that “Alternatives to the SSNs in formations were diesel Air Independent Propulsion (AIP) submarines and unmanned undersea vehicles (UUVs). The AIP submarines were substituted for Virginia class SSNs on a cost basis of roughly four to one. These submarines could be nuclear-powered if they are designed and built based upon a competitive, cost suppressing business model.” (Page 60) The strategy of transporting the AIP submarines to the theater using transport ships is not mentioned in the report but was explained at a February 18, 2005 meeting between CRS and analysts who contributed to the OFT report.

The totals shown in the table do not include SSNs, cruise missile submarines (SSGNs), and ballistic missile submarines (SSBNs) operating independently of the 12 CSGs, 12 ESGs, and 9 SSGs. The totals also do not include combat logistics ships other than the TAOEs (e.g., oilers, ammunition ships, and general stores ships) and fleet support ships. The Navy's 375-ship proposal, by comparison, includes all these kinds of ships.

As also can be seen from the table, the difference between Alternatives A and B is that the former uses 1,000-ton surface combatants while the latter uses 100-ton surface combatants that are transported into the theater by mother ships, and the difference between Alternatives B and C is that the former uses 57,000-ton aircraft carriers while the latter substitutes 13,500-ton carriers.

CSBA Report.⁵¹ The CSBA report uses many of the same ship designs currently planned by the Navy, but also proposes some new ship designs. The CSBA report also proposes ship formations that in some cases are different than those planned by the Navy. **Table 7** below compares the CSBA-recommended force structure to CNA's recommended force range, the Navy's 375-ship fleet proposal of 2002-2004, and the notional 260- and 325-ship fleets for FY2035 presented in the Navy's March 2005 interim report to Congress.

⁵¹ Robert O. Work, *Winning the Race: A Naval Fleet Platform Architecture for Enduring Maritime Supremacy*, Center for Strategic and Budgetary Assessments (CSBA), 2005.

Table 7. CSBA-Recommended Force and Other Proposals

Ship type	CSBA force	CNA force range	Navy 375-ship proposal of 2002-2004 ^a	Notional Navy fleets for FY2035	
				260 ships	325 ships
Ballistic missile submarines (SSBNs)	12 ^b	14	14	14	14
Cruise missile submarines (SSGNs)	6 ^b	4	4	4	4
Attack submarines (SSNs)	54 ^c	38 to 62	52	37	41
Large-deck aircraft carriers (CVNs)	10	10 to 12	12	10	11
Medium aircraft carriers (CVEs)	4	0	0	0	0
Afloat forward staging base (AFSB)	1	0	0	0	0
Cruisers and destroyers	84 or 86	66 to 112	109	67	92
Littoral combat ships (LCSs)	84	40 to 70	56	63	82
Amphibious ships	32 ^d	18 to 30	36	17	24
Maritime Prepositioning Force ships	16 ^e	19 to 21 ^e	18 ^e	14 ^e	20 ^e
Combat logistics (resupply) ships	36 ^f	25 to 33	33	24	26
Other ^g	34 ^h	22	41	10	11
Total battle force ships	373 or 375ⁱ	256 to 380	375	260	325

Source: Table prepared by CRS based on CSBA report, CNA report, and March 2005 Navy report.

- a. Composition as shown in CNA report as the program of record for 2022. An earlier and somewhat different composition is shown elsewhere in this CRS report.
- b. Alternatively, 10 SSBNs and 8 SSGNs.
- c. Includes one special-mission submarine. Total number drops slightly over next 12 years.
- d. Includes eight LHDs and 24 LPD-17s.
- e. In the CSBA force, these are existing MPF ships; in the other fleets, they are MPF(Future) ships.
- f. Includes eight TAOEs, 11 TAKEs, and 17 TAOs.
- g. Includes command ships, and support ships (such as salvage ships and submarine tenders), dedicated mine warfare ships, and sea basing connector ships.
- h. Includes, among other ships, 2 TAVBs and 8 TLKAs associated with the amphibious and MPF ships.
- i. In addition to these ships, the CSBA report notes that U.S. maritime forces would include 35 DOD prepositioning and surge sealift ships used primarily by the Army and Air Force, and 91 large, medium, and fast-response (i.e., small) cutters planned for procurement under the Coast Guard Deepwater acquisition program.

The CSBA report makes numerous specific recommendations for ship force structure and ship acquisition, including the following:

Aircraft Carriers. When the George H.W. Bush (CVN-77) enters service in 2008 or 2009:

- Retire the two remaining conventional carriers — the Kitty Hawk (CV-63) and the Kennedy (CV-67).
- Convert the Enterprise (CVN-65) into an afloat forward staging base (AFSB) with a mixed active/reserve/civilian crew, to be used in peacetime for aviation testing and in crises for embarking special operations forces, Army or Marine Corps forces, or joint air wings.
- Begin replacing the 10 Nimitz (CVN-68) class carriers on a one-for-one basis with CVN-21-class carriers procured once every five years using incremental funding.
- Redesignate the LHA(R) as a medium sized carrier (CVE) and procure one every three years starting in FY2007 using incremental funding.⁵²

Submarines.

- Maintain Virginia-class SSN procurement at one per year for the next several years, producing an eventual total of perhaps 20 Virginia-class boats.
- Begin immediately to design a new “undersea superiority system” with a procurement cost 50% to 67% that of the Virginia-class design, with the goal of achieving a procurement rate of two or three of these boats per year no later than FY2019.
- Study options for extending the service lives of the three Seawolf SSNs and the 31 final Los Angeles-class SSNs to mitigate the projected drop in SSN force levels during the 2020s.
- Reduce the SSBN force from 14 ships to 12 ships and convert an additional two SSBNs into SSGNs, for a total of six SSGNs.
- Study the option of reducing the SSBN force further, to 10 ships, which would permit another two SSBNs to be converted into SSGNs, for a total of eight SSGNs.⁵³

Destroyers and Cruisers.

- Procure a single DD(X) in FY2007, using research and development funding, as the first of three surface combatant technology demonstrators.
- Start a design competition for a next generation, modular surface combatant or family of combatants, with capabilities equal to or greater than the DD(X)/CG(X), but with a substantially lower procurement cost.

⁵² CSBA report, slides 154-158.

⁵³ CSBA report, slides 276, 284, 289, 297, 299.

- Build two additional surface combatant technology demonstrators to compete against the DD(X) design.
- Use the results of this competition to inform the design of a new surface combatant, called SCX, with a procurement cost perhaps one-third to one-half that of the DD(X).
- Begin procuring this new design in FY2015 as a replacement for the DD(X)/CG(X) program.
- Consider modifying the LPD-17 design into a low-cost naval surface fire support ship carrying the Advanced Gun System (AGS) that was to be carried by the DD(X).
- Consider procuring two additional DDG-51s to help support the surface combatant industrial base in the near-term.⁵⁴

Littoral Combat Ships and Coast Guard Deepwater Cutters.

- Procure six LCSs per year for a total of 84 LCSs — 42 of the Lockheed design, and 42 of the General Dynamics design.
- Organize these 84 ships into 42 divisions, each consisting of one Lockheed ship and one General Dynamics ship, so that each division can benefit from the complementary strengths of the two designs.
- Ensure that mission packages for the LCS and mission packages for the Coast Guard's large and medium Deepwater cutters are as mutually compatible as possible.
- Include the Coast Guard's Deepwater cutters when counting ships that contribute to the country's total fleet battle network.
- Begin a research and development and experimentation program aimed at building several competing stealth surface combatant technology demonstrators for operations in contested or denied-access waters.⁵⁵

Amphibious Ships.

- Complete LHD-8 to create a force of eight LHDs.
- Rather than stopping procurement of LPD-17s after the ninth ship in FY2007, as now planned by the Navy, increase the LPD-17 procurement rate to two ships per year and use multiyear procurement (MYP) to procure a total of 24 LPD-17s.
- Retire the 12 existing LSD-41/49 class ships, leaving a 32-ship amphibious fleet consisting of eight LHDs and 24 LPD-17s.

⁵⁴ CSBA report, slides 246, 249, and 251-253. Slide 249 states that possibilities for a reduced-cost alternative to the DD(X) include a surface combatant based on the LPD-17 design, a semi-submersible ship built to commercial standards (like a ship called the "Stryker" that was proposed several years ago), and a large or medium "carrier of large objects," perhaps built to relaxed commercial standards.

⁵⁵ CSBA report, slides 275, 277, and 283.

- Form eight “distributed expeditionary strike bases” — each of which would include one LHD, three LPD-17s, one Aegis cruiser, three Aegis destroyers, two LCSs, and one SSGN.⁵⁶

MPF and Other Ships.

- Retain the three existing MPF squadrons over the near- to mid-term.
- Reconfigure two of the squadrons for irregular warfare.
- Use the third squadron as a swing asset to either reinforce the two irregular-warfare squadrons or to provide lift for assault follow-on echelon amphibious landing forces.
- Develop high-speed intra-theater and ship-to-shore surface connectors.
- Design an attack cargo ship (TAKA) to help support sustained joint operations ashore, with a target unit procurement cost of \$500 million or less, and begin procuring this ship in FY2014.
- Replace the two existing hospital ships, the four existing command ships, and existing support tenders with new ships based on the LPD-17 design.
- Initiate a joint experimental program for future sea-basing platforms and technologies.⁵⁷

The CSBA report raises several questions about the Navy’s emerging sea basing concept for conducting expeditionary operations ashore. The report states:

The work done thus far on sea basing is intriguing, but neither the concept nor the supporting technologies appear sufficiently mature to justify any near-term decisions such as canceling LPD-17 [procurement] in favor of MPF(F) ships, or removing the well deck from the big deck amphibious assault platforms, both of which would severely curtail the [fleet’s] ability to launch surface assaults over the longer term.

Given these large uncertainties, no major moves toward the sea basing vision should be made without further exploring the sea basing concept itself, and experimenting with different numbers and types of sea base platforms, connectors, and capabilities.⁵⁸

Observations

Observations about the CNA, OFT, and CSBA reports can be made on several points, including the following:

- organizations and authors;
- analytical approach;

⁵⁶ CSBA report, slides 227 and 236.

⁵⁷ CSBA report, slides 228-232, and 307.

⁵⁸ CSBA report, slide 212.

- use of prospective ship-procurement funding levels as a force-planning consideration;
- fleet size and structure;
- whether the recommended force qualifies as an alternative fleet architecture;
- fleet capability;
- transition risks; and
- implications for the industrial base.

Each of these is discussed below.

Organizations and Authors.

CNA Report. CNA is a federally funded research and development center (FFRDC) that does much of its analytical at the Navy's request. The CNA report's discussion of how crew rotation may alter force-level requirements for maintaining day-to-day forward deployments is somewhat detailed and may have been adapted from other work that CNA has done on the topic for the Navy.

OFT Report. The OFT report was prepared under the direction of retired Navy admiral Arthur Cebrowski, who was the director of OFT from October 29, 2001 until January 31, 2005 and the President of the Naval War College (NWC) from July 24, 1998 to August 22, 2001. During his time at NWC and OFT, Cebrowski was a leading proponent of network-centric warfare and distributed force architectures.

CSBA Report. The CSBA report was prepared by Robert Work, CSBA's analyst for maritime issues. CSBA describes itself as "an independent, policy research institute established to promote innovative thinking about defense planning and investment strategies for the 21st century. CSBA's analytic-based research makes clear the inextricable link between defense strategies and budgets in fostering a more effective and efficient defense, and the need to transform the US military in light of an emerging military revolution."⁵⁹ CSBA's Executive Director is Dr. Andrew F. Krepinevich, Jr., whose previous experience includes work in DOD's Office of Net Assessment, the office directed by Andrew Marshall. Krepinevich is generally considered a major writer on defense transformation.

Analytical Approach.

CNA Report. The CNA report grounds its analysis in traditional DOD force-planning considerations and campaign modeling. The report cites past DOD force-planning studies that reflect similar approaches. The implicit argument in the CNA report is that its findings have weight in part because they reflect a well-established and systematic approach to the problem.

⁵⁹ See CSBA's website [<http://www.csbaonline.org>].

OFT Report. In contrast to the CNA report, the OFT report “calls into question the viability of the longstanding logic of naval force building.”⁶⁰ The OFT report grounds its analysis in four major force-design principles that the report identifies as responsive to future strategic challenges and technological opportunities.⁶¹ The report then seeks to design a fleet that it is consistent with these principles, and assesses that fleet using a new set of metrics that the report believes to be consistent with these principles. The implicit argument in the OFT report is that its findings have weight in part because they reflect major force-design principles that respond to future strategic challenges and technological opportunities.

CSBA Report. The CSBA report employs an extensive historical analysis of the missions and structure of the U.S. Navy and other navies. The report argues that the structure of the U.S. Navy has shifted over time in response to changes in technology and U.S. security challenges, and that U.S. military forces have entered a new security era (which the report calls the “Joint Expeditionary Era”) during which the U.S. Navy will need to do three things.⁶² To do these three things, the report argues, the Navy should be structured to include four different force elements.⁶³ The report constructs these four force elements and then combines them to arrive at an overall recommended Navy force structure. The implicit argument in the CSBA report is that its findings have weight in part because they reflect insights about future missions and force requirements gained through careful historical analysis of the missions and structure of the U.S. Navy and other navies.

Prospective Ship-Procurement Funding Levels as Consideration.

CNA Report. The CNA report aims at designing a cost-effective fleet. It also mentions cost estimates relating to the option of homeporting additional attack submarines at Guam.⁶⁴ Prospective ship-procurement funding levels, however, are not prominently featured in the CNA report as a force-planning consideration.

OFT Report. Prospective ship-procurement funding levels are a significant force-planning consideration in the OFT report. The report argues that an important metric for assessing a proposed fleet architecture is the ease or difficulty with which it can be scaled up or down to adapt to changes in ship-procurement funding levels.

⁶⁰ OFT report, p. 1.

⁶¹ The principles are complexity, smaller ships and improved payload fraction, network-centric warfare, and modularity.

⁶² These three things are: (1) contribute to the global war on terrorism (GWOT); (2) prepare for possible nuclear-armed regional competitors; and (3) hedge against the possibility of a disruptive maritime competition with China.

⁶³ These four force elements are: (1) a sea-based power-projection and regional deterrence force; (2) a global patrol, GWOT, and homeland defense force; (3) a force for prevailing over enemy anti-access/area-denial forces; and (4) a strategic deterrence and dissuasion force.

⁶⁴ CNA Report, p. 36.

The OFT report contains a fairly detailed discussion of the Navy's budget situation that calls into question, on several grounds, the Navy's prospective ability to afford its 375-ship proposal. The report concludes that funding for Navy ship-procurement in future years may fall as much as 40% short of what would be needed to achieve the Navy's 375-ship fleet proposal. If the shortfall is 40%, the report estimates, the Navy could maintain a force of 270 to 315 ships, which is comparable in number to today's force of 288 ships, except that the future force would include a substantial number of relatively inexpensive LCSs. If proportionate reductions are applied to the OFT fleets shown in **Table 6**, Alternative A would include 402 to 469 ships, Alternative B would include 557 to 650 ships, and Alternative C would include 609 to 711 ships. Again, these totals would not include certain kinds of ships (independently operating SSNs, etc.) that are included in the total of 270 to 315 ships associated with the Navy's currently planned architecture.

CSBA Report. As with the OFT report, prospective ship-procurement funding levels are a significant force-planning consideration in the CSBA report. The CSBA report estimates that in future years, the Navy may have an average of about \$10 billion per year in ship-acquisition funding. The report then aims at designing a force whose ships could be acquired for this average annual amount of funding.

Fleet Size and Structure.

CNA Report. The 380-ship fleet at the high end of the CNA range is similar in size and composition to the Navy's 375-ship fleet proposal. The 256-ship fleet at the low end of the CNA range is similar in size and composition to the Navy's 260-ship fleet for FY2035, except that the 260-ship fleet has more LCSs and fewer ships in the "other ships" category.⁶⁵

OFT Report. The OFT-recommended fleet would have a much larger total number of ships than the Navy's planned fleet. The OFT fleet would also feature a much larger share of small combatants. Of the ships shown in **Table 6**, the small combatants account for about 75% in Alternative A, about 79% in Alternative B, and about 72% in Alternative C. (Adding into the mix SSNs and other kinds of ships not shown in **Table 6** would reduce these percentages somewhat.) In the Navy's notional 260- and 325-ship fleets, by contrast, LCSs account for about 25% of the total number of ships.

The OFT architecture is similar in certain ways to a fleet architecture proposed by the Naval Surface Warfare Center (NSWC) between 1989 and 1992 and sometimes referred to as the Carrier of Large Objects (CLO) proposal. The NSWC architecture, like the OFT architecture, employed a common hull design for a large

⁶⁵ Additional points of comparison: The CNA range of 256 to 380 ships overlaps with potential ranges of 290 to 375 ships, 260 to 325 ships, and 243 to 302 ships presented in the Navy's February 2005 testimony to Congress. The mid-point of the CNA-recommended range (318 ships) is similar in terms of total numbers of ships to the 310-ship fleet from the 2001 Quadrennial Defense Review (QDR). Unlike the 2001 QDR fleet, however, the CNA-recommended force includes several dozen Littoral Combat Ships (LCSs) and smaller numbers of other kinds of ships.

ship that could be built in several variants for various missions, including aviation, missile launching and fire support, amphibious warfare, logistics support, and mother-ship support of small, fast, surface combatants. The small, fast surface combatants in the NSW architecture were called scout fighters and were in the same general size range as the 100- and 1,000-ton surface combatants in the OFT architecture.⁶⁶

CSBA Report. The CSBA force would have about the same total number of ships as the Navy's 375-ship fleet proposal. CSBA's subtotals for some ship categories are similar to subtotals in one or more of the other fleet proposals shown in **Table 5**. Significant differences between the CSBA proposal and the other fleet proposals shown in **Table 7** include:

- the four medium-sized aircraft carriers (CVEs);
- the conversion of a carrier into an afloat forward staging base;
- the composition of the cruiser-destroyer force (which would include SCXs rather than DD(X)s and CG(X)s);
- the composition of the amphibious fleet (which would have additional LPD-17s in lieu of today's LSD-41/49s); and
- the composition of the maritime prepositioning force (which would continue to include, for a time at least, today's MPF ships rather than the Navy's planned MPF(F) ships).

Does it Qualify as an Alternative Force Architecture.

CNA Report. As mentioned earlier, the CNA report uses essentially the same kinds of ships and naval formations as those planned by the Navy. If an alternative fleet platform architecture is defined as one that uses ship types or naval formations that differ in some significant way from those currently used or planned, then the CNA-recommended force arguably would not qualify as an alternative fleet platform architecture.

OFT Report. Since the OFT report proposes building ships that are substantially different from those currently planned, and combines them ships into formations which, although similar in name to currently planned formations (i.e., CSGs, ESGs, and SSGs), might be viewed by some observers as substantially different in composition from the currently planned versions of these formations, the

⁶⁶ For more on this proposed fleet architecture, see Norman Polmar, "Carrying Large Objects," *U.S. Naval Institute Proceedings*, December 1990, pp. 121-122; Michael L. Bosworth *et al*, "Multimission Ship Design for an Alternative Fleet Concept," *Naval Engineers Journal*, May 1991, pp. 91-106; Michael L. Bosworth, "Fleet Versatility by Distributed Aviation," *U.S. Naval Institute Proceedings*, Jan. 1992, pp. 99-102; and Victor A. Meyer, "Naval Surface Warfighting Vision 2030," *Naval Engineers Journal*, May 1992, pp. 74-88. See also "USN's '2030' Plan For Future Fleet," *Sea Power*, Apr. 1992, pp. 79, 82; Edward J. Walsh, "'Alternative Battle Force' Stresses Commonality, Capability," *Sea Power*, Feb. 1991, pp. 33-35; Robert Holzer, "Navy Floats Revolutionary Ship Design for Future Fleet," *Defense News*, May 14, 1990, pp. 4, 52; and Anne Rumsey, "Navy Plans Ship Look-A-Likes," *Defense Week*, Mar. 13, 1989, p. 3.

OFT-recommended force arguably would qualify as an alternative fleet platform architecture.

CSBA Report. Since the CSBA report proposes building ships that in some cases are different from those currently planned, and combines these ships into formations that in some cases are different in composition from those currently planned, the CSBA-recommended force arguably would qualify as an alternative fleet platform architecture, though less dramatically so than the OFT-recommended force.

New Ship Designs.

CNA Report. The CNA report does not propose any ship designs other than those already planned by the Navy.

OFT Report. The 57,000-ton aircraft carrier in the OFT report would be roughly the same size as the United Kingdom's new aircraft carrier design, and somewhat larger than the U.S. Navy's 40,000-ton LHA/LHD-type amphibious assault ships. Compared to the U.S. Navy's aircraft carriers, which displace 81,000 to 102,000 tons, this ship could be considered a medium-size carrier.

The 57,000-ton missile-and-rocket ship in the OFT report could be considered similar in some respects to the Navy/DARPA arsenal ship concept of 1996-1997, which would have been a large, relatively simple surface ship equipped with about 500 VLS tubes.⁶⁷

The 13,500-ton aircraft carrier in the OFT report would be slightly larger than Thailand's aircraft carrier, which was commissioned in 1997, and somewhat smaller than Spain's aircraft carrier, which was based on a U.S. design and was commissioned in 1988. Due to its SES/catamaran hull design, this 13,500-ton ship would be much faster than the Thai and Spanish carriers (or any other aircraft carrier now in operation), and might have a larger flight deck. This ship could be considered a small, high-speed aircraft carrier.

The 1,000- and 100-ton surface combatants in the OFT report could be viewed as similar to, but smaller than, the 2,500- to 3,000-ton Littoral Combat Ship (LCS). Compared to the LCS, they would be closer in size to the Streetfighter concept (a precursor to the LCS that was proposed by retired admiral Cebrowski during his time at the Naval War College).

The AIP submarine in the OFT report could be similar to AIP submarines currently being developed and acquired by some foreign navies.

⁶⁷ For more on the arsenal ship, see CRS Report 97-455, *Navy/DARPA Arsenal Ship Program: Issues and Options for Congress*, by Ronald O'Rourke; and CRS Report 97-1044, *Navy/DARPA Maritime Fire Support Demonstrator (Arsenal Ship) Program: Issues Arising From Its Termination*, by Ronald O'Rourke. Both reports are out of print and are available directly from the author.

CSBA Report. The proposal in the CSBA report for an afloat forward staging base (AFSB) is similar to other proposals for AFSBs that have been reported in recent years, though other proposals have suggested using commercial ships or military sealift ships rather than converted aircraft carriers as the basis for the AFSB.⁶⁸

The CVE in the CSBA report, like the 57,000-ton carrier in the OFT report, can be viewed as a medium-sized carrier. With a full load displacement of perhaps about 40,000 tons, the CVE would be somewhat smaller than the 57,000-ton carrier and consequently might embark a smaller air wing. The CVE, however, would be based on the LHA(R) amphibious ship design rather than a merchant-like hull, and consequently could incorporate more survivability features than the 57,000-ton carrier.

The proposal in the CSBA report for a new undersea superiority system with a procurement cost 50% to 67% that of the Virginia-class SSN design is similar to the Tango Bravo SSN discussed earlier in this testimony.

The proposals in the CSBA report for a reduced-cost new-design surface combatant called the SCX, and for a low-cost gunfire support ship, are broadly similar to the options for a reduced-cost new-design surface combatant discussed earlier in this testimony.

Fleet Capability.

CNA Report. The CNA report uses essentially the same kinds of ships and formations as planned by the Navy, and recommends generally the same numbers of ships as a function of force-planning variables such as use of crew rotation. As a consequence, the CNA-recommended force range would be roughly similar in overall capability to the Navy's planned architecture.

OFT Report. The OFT architecture differs so significantly from the Navy's planned architecture that assessing its capability relative to the Navy's planned architecture is not easy. As a general matter, the OFT report stresses overall fleet survivability more than individual-ship survivability, and argues that fleet effectiveness can be enhanced by presenting the enemy with a complex task of having to detect, track, and target large numbers of enemy ships. The OFT report

⁶⁸ See, for example, Stephen M. Carmel, "A Commercial Approach to Sea Basing — Afloat Forward Staging Bases," *U.S. Naval Institute Proceedings*, Jan. 2004, pp. 78-79; Christopher J. Castelli, "Budget Anticipates Developing MPF(F) Aviation Variant From LMSR," *Inside the Navy*, Jan. 19, 2004; Christopher J. Castelli, "Brewer Proposes Commercial Ship To Test Seabasing Technologies," *Inside the Navy*, Jan. 27, 2003; Christopher J. Castelli, "In POM-04, Navy Cancels JCC(X), Plans To Substitute MPF(F) Variant," *Inside the Navy*, Sept. 2, 2002; Christopher J. Castelli, "Navy May Develop New Support Ships, Pursue Sealift Experimentation," *Inside the Navy*, May 27, 2002.

argues that in addition to warfighting capability, a fleet can be judged in terms of its capability for adapting to changes in strategic demands and funding levels.⁶⁹

Readers who agree with most or all of these propositions might conclude that the OFT-recommended architecture would be more capable than the Navy's planned architecture. Readers who disagree with most or all of these propositions might conclude that the OFT-recommended architecture would be less capable than the Navy's planned architecture. Readers who agree with some of these propositions but not others (or who agree with these propositions up to a certain point, but less fervently than OFT), might conclude that the OFT-recommended architecture might be roughly equal in total capability to the Navy's planned architecture.

In addressing the question of fleet capability, the OFT report states:

Alternative fleet formations consisting of small fast and relatively inexpensive craft combining knowledge and attaining flexibility through networking appear superior to the programmed fleet for non-traditional warfare in a variety of settings. This is due to increasing the complexity the enemy faces and increasing U.S. fleet options that in turn reduce enemy options. The speed and complexity of the alternative fleets can provide them with the capability to complicate and possibly defeat the attempts of non-traditional adversaries to

⁶⁹ The OFT report argues that its recommended fleet architecture would:

- “provide a quantum leap ahead in capabilities against a spectrum of enemies ranging from large, highly developed competitors to small but determined asymmetric adversaries” (page 6) and be adaptable, in a dynamic and less-predictable security environment, to changing strategic or operational challenges;
- be capable of both participating in joint expeditionary operations and maintaining “the strategic advantage the Navy has developed in the global commons,” avoiding a need to choose between optimizing the fleet for “performance against asymmetric challenges at the expense of its ability to confront a potential adversary capable of traditional high intensity conflict,” such as China; (pages 1 and 2)
- pose significant challenges to adversaries seeking to counter U.S. naval forces due to the “large numbers of combat entities that the enemy must deal with; a great variety of platforms with which the enemy must contend; speed; different combinations of forces; distribution of forces across large areas; and [adversary] uncertainty as to the mission and capabilities of a given platform;” (page i)
- permit more constant experimentation with new operational concepts, and thereby achieve higher rates of learning about how to evolve the fleet over time; and
- recognize potential future constraints on Navy budgets and make the Navy more smoothly scalable to various potential future resource levels by shifting from a fleet composed of limited numbers of relatively expensive ships to one composed of larger numbers of less expensive ships.

elude surveillance. The enemy could have difficulty determining what to expect and how to defeat them all. The superior speed and more numerous participants than in the programmed fleet provide a stronger intelligence base and more numerous platforms from which to conduct strikes and interceptions. This appears to be true even if the smaller craft are *individually* somewhat less capable and less able to sustain a hit than the larger ships in the programmed fleet.

If these circumstances are not achieved, and the enemy can continue to elude and deceive, the [Navy's] programmed fleet often is as good as the [OFT] alternatives, sometimes even better. It is not necessarily better in cases in which individual ship survivability dominates, a perhaps counterintuitive result until we realize that *fleet* survivability not *individual ship* survivability is what dominates.

An area in which programmed fleets might have an advantage would be when the long loiter time or deep reach of CTOL [conventional takeoff and landing] aircraft on programmed big-deck CVNs [nuclear-powered aircraft carriers] is needed. That said, there need be no great sacrifice. With airborne tanking, the VSTOL [very short takeoff and landing] aircraft in the alternatives could meet the deep strike and long loiter demands. Also, as mentioned earlier, a combination of advances in EMALS [electromagnetic aircraft launch system] and modifications to the JSF will make it possible to launch the JSF with only a marginal range-payload capability penalty. Moreover, trends in technology are providing *unmanned* aircraft greater capability, including greater loiter time and sensor capability.⁷⁰

CSBA Report. The CSBA report argues that its architecture would provide a total capability equal to that of the Navy's planned architecture, but at a lower total cost, because the CSBA architecture would:

- employ new ship designs, such the new undersea superiority system and the SCX, that, because of their newer technologies, would cost less than, but be equal in capability to, current designs such as the Virginia-class SSN and DD(X) destroyer; and
- make more use of the LPD-17 hull design, whose basic design costs have already been paid, and which can be produced efficiently in large numbers and adapted economically to meet various mission requirements.

It is plausible that using newer technologies would permit new, reduced-cost, ship designs to be more capable than such designs would have been in the past. Whether the increases in capability would always be enough to permit these ships to be equal in capability to more expensive current designs is less clear. The Navy may be able to achieve this with a new SSN design, because several new submarine technologies have emerged since the Virginia-class design was developed in the 1990s, but achieving this with a new large surface combatant design could be more challenging, because the DD(X) design was developed within the last few years and few new surface combatant technologies may have emerged since that time. If one

⁷⁰ OFT report, pp. 75-76. Italics as in the original.

or more of the reduced-cost designs turn out to be less capable than current designs, then the CSBA architecture would not generate as much total capability as the report projects.

The CSBA report also argues that its architecture would produce a force with a mix of capabilities that would better fit future strategic demands. To achieve this, the report recommends, among other things, reducing currently planned near-term procurement of new destroyers and MPF(F) ships, increasing currently planned procurement of new amphibious ships, and a changing the currently planned investment mix for aircraft carriers.

Readers who agree with CSBA's description of future strategic demands, and who agree that CSBA's recommended investment changes respond to those demands, might conclude that the CSBA-recommended architecture would be better optimized than the Navy's planned architecture to meet future needs. Readers who disagree with one or both of these propositions might conclude that the Navy's planned architecture might be better optimized, or that neither architecture offers clear advantages in this regard.

Implementation Risks.

CNA Report. Implementation risks associated with the force recommended in the CNA report include developing and designing the various types of ships included in the plan — including in particular the DD(X) destroyer, which is to incorporate a number of new technologies — and the issue of whether Navy funding levels in coming years would be adequate to build and maintain the recommended fleet.

OFT Report. The OFT report does not include a detailed plan for transitioning from today's fleet architecture to its proposed architecture,⁷¹ but such a plan could be

⁷¹ On the topic of transitioning to the proposed fleet architecture, the report states:

Implementation of the alternative fleet architecture should start now and should target option generation, short construction time, and technology insertion. The alternative further provides an opportunity to reinvigorate the shipbuilding industrial base. The many smaller ships, manned and unmanned, in the alternative fleet architecture could be built in more shipyards and would be relevant to overseas markets. The potential longevity of the existing fleet will sustain existing shipyards as they move into building smaller ships more rapidly in this broader market and more competitive environment. The shipyards would develop a competence, broad relevance, and operate in an environment driven by market imperatives instead of a framework of laws that frustrates market forces.

As the new ships enter service and the fleet has the opportunity to experiment with new operational concepts (expanded network-centric warfare in particular) existing ships can be retired sooner to capture operations savings. At this point, the sooner the existing fleet is retired, the sooner the benefits of the alternative fleet architecture design will accrue. (Page 3)

(continued...)

developed as a follow-on analysis. The plan could involve replacing existing ship designs and associated formations as they retire with OFT's recommended new ship designs and associated formations. Implementation risks associated with the force recommended in the OFT report include developing and designing the eight new types of ships included in the plan, including the four types of large ships based on the 57,000-ton commercial-like hull, the 13,500-ton SES/catamaran aircraft carrier (since it would be much larger than other SES/catamaran ships), the AIP submarine (since the AIP technology is relatively new and a non-nuclear-powered submarine has not been designed and built for the U.S. Navy since the 1950s), and the 1,000- and 100-ton surface combatants (since new technologies are needed to achieve the increased payload fraction that these ships are to have). The OFT-recommended force could pose implementation risks due to the new kinds of naval formations that would be used, which could require development of new doctrine, concepts of operations, and tactics.

CSBA Report. A stated goal of the CSBA report is to provide a detailed, practical transition road map for shifting from today's fleet structure to the report's recommended fleet structure. The many specific recommendations made in the report could be viewed as forming such a road map. Implementation risks associated with the force recommended in the CSBA report include developing and designing the reduced-cost SSN and the reduced-cost SCX surface combatant, particularly since these two new ship designs are equal in capability to the more expensive designs they would replace.

Implications For Industrial Base.

CNA Report. Since the CNA report uses essentially the same kinds of ships and naval formations as those in use today or planned by the Navy, and recommends similar numbers of ships, the industrial-base implications of the CNA-recommended force would appear to be similar to those of the Navy's current plans.

OFT Report. The OFT report seeks to reduce unit shipbuilding costs, and thereby permit an increase in total ship numbers, by shifting the fleet away from complex, highly integrated ship designs that are inherently expensive to build and toward less-complex merchant-like hulls and small sea frames that are inherently less expensive to build. Similarly, the OFT report seeks to increase shipbuilding options for the Navy by shifting the fleet away from complex, highly integrated ship designs that can be built only by a limited number of U.S. shipyards and toward less-complex merchant-like hulls and small sea frames that can be built by a broader array of shipyards. The OFT report also aims to make it easier and less expensive to modernize ships over their long lives, and thereby take better advantage of rapid developments in technology, by shifting from highly integrated ship designs to merchant-like hulls and sea frames.

As a consequence of these objectives, the OFT report poses a significant potential business challenge to the six shipyards that have built the Navy's major

⁷¹ (...continued)

Additional general discussion of implementation is found on pp. 76-77 of the report.

warships in recent years. The report's discussion on implementing its proposed architecture states in part:

The shipbuilding industrial base would also need to start to retool to build different types of ships more rapidly. Smaller shipyards, which presently do little or no work for the Navy could compete to build the smaller ships, thereby broadening the capabilities base of ship design and construction available to the Navy. The change to smaller, lower unit cost ships would also open up overseas markets. With more shipyards able to build the ships and potential for a broader overall market, the U.S. shipbuilding industry would have the chance to expand its competence, innovation and relevance. Taken together this would sharpen the industry's ability to compete and provide alternatives to a ship procurement system that is beset by laws and regulations that frustrate, even pervert, market forces.⁷²

The report's concluding section lists five "dangers" that "risk the Navy's 'losing the way.'" One of these, the report states, is "Shielding the shipbuilding industrial base from global competition," which the report states "guarantees high cost, limited innovation, and long cycle times for building ships."⁷³

CSBA Report. The CSBA report similarly raises significant potential issues for the six shipyards that have built the Navy's major warships in recent years. The report states that "Rationalizing the defense industrial base is... a critical part of DoN's [the Department of the Navy's] maritime competition strategy, and should be the subject of immediate consideration and deliberation by the Congress, DoD, and the DoN."⁷⁴ The report states:

Numerous studies have indicated that the six Tier I yards [i.e., the six yards that have built the Navy's major warships in recent years] have "exorbitant excess capacities," which contribute to the rising costs of [Navy] warships, primarily because of high industrial overhead costs. These capacities are the result of "cabotage laws and fluctuating national security acquisition policies that force shipbuilders of combatants to retain capacities to address required surges in coming years." This last point is especially important: the DoN contributes greatly to the problem of "exorbitant capacities" by its consistent tendency to portray overly optimistic ramp ups in ship production in budget "out years."⁷⁵

The report recommends the following as part of its overall transition strategy:

- Minimize production costs for more expensive warships (defined in the report as ships costing more than \$1.4 billion each) by consolidating production of each kind of such ship in a single shipyard, pursuing learning curve efficiencies, and requesting use of multiyear procurement (MYP) whenever possible.

⁷² OFT report, p. 76.

⁷³ OFT report, p. 80.

⁷⁴ CSBA report, slide 314.

⁷⁵ CSBA report, slide 315.

- Minimize production costs for warships and auxiliaries costing less than \$1.4 billion each by emphasizing competition, shifting production to smaller “Tier II” yards, using large production runs, and enforcing ruthless cost control.⁷⁶

The report states that “the strategy developed in this report suggests that [Navy] planners might wish to:”

- maintain production of aircraft carriers at NGNN,
- consolidate production of large surface combatants and amphibious ships at NG/Ingalls, and
- consolidate submarine building GD/EB, or with a new, single submarine production company.⁷⁷

The report states that the second of these possibilities is guided by the building sequence of LPD-17s and SCXs recommended in the report, NG/Ingalls’ ability to build a wider variety of ships than GD/BIW, NG/Ingalls’ surge capacity, and the availability of space for expanding NG/Ingalls if needed.⁷⁸

The report states that the third of these possibilities is guided by the low probability that procurement of Virginia-class submarines will increase to two per year, the cost savings associated with consolidating submarine production at one yard, GD/EB’s past experience in building SSBNs and SSNs, GD/EB’s surge capacity, and the fact that building submarines at GD/EB would maintain two

⁷⁶ CSBA report, slide 316. Other steps recommended as part of the report’s overall transition strategy (see slides 124 and 125) include the following:

- Plan to a fiscally prudent steady-state shipbuilding budget of \$10 billion per year.
- Maximize current capabilities and minimize nonrecurring engineering costs for new platforms by maintaining and pursuing hulls in service, in production or near production that can meet near- to mid-term GWOT requirements and that are capable of operating in defended-access scenarios against nuclear-armed regional adversaries.
- Identify and retain or build large numbers of common hulls that have a large amount of internal reconfigurable volume, or that can carry a variety of modular payloads, or that can be easily modified or adapted over time to new missions.
- Pursue increased integration of Navy and Marine warfighting capabilities and emphasize common systems to increase operational effectiveness and reduce operation and support (O&S) costs.
- Focus research and development efforts on meeting future disruptive maritime challenges, particularly anti-access/area-denial networks composed of long-range systems and possibly weapons of mass destruction.

⁷⁷ CSBA report, slides 317-318.

⁷⁸ CSBA report, slide 318.

shipyards (GD/EB and NGNN) capable of designing and building nuclear-powered combatants of some kind.⁷⁹

The report acknowledges that yard consolidation would reduce the possibilities for using competition in shipbuilding in the near term and increase risks associated with an attack on the shipbuilding infrastructure, but notes that DOD consolidated construction of nuclear-powered carriers in a single yard years ago, and argues that competition might be possible in the longer run if future aircraft-carrying ships, the SCX, and the new undersea superiority system could be built in Tier II yards.⁸⁰

The report states:

Given their current small yearly build numbers, consolidating construction of aircraft carriers, surface combatants, and submarines in one yard [for each type] makes sense. However, the same logic does not hold true for auxiliaries and smaller combatants. These ships can normally be built at a variety of Tier I and Tier II yards; competition can thus be maintained in a reasonable and cost-effective way. For example, competing auxiliaries and sea lift and maneuver sea base ships between NASSCO, Avondale, and Tier II yards may help to keep the costs of these ships down.

Building multiple classes of a single ship [type] is another prudent way to enforce costs, since the DoN can divert production of any ship class that exceeds its cost target to another company/class that does not. Simultaneously building both the [Lockheed] and [General Dynamics] versions of [the] LCS, and the Northrop Grumman National Security Cutter, Medium [i.e., the medium-sized Deepwater cutter] gives the DoN enduring capability to shift production to whatever ship stays within its cost target....

Of course, Congress and the DoN may elect to retain industrial capacity, and to pay the additional “insurance premium” associated with having excess shipbuilding capacity. For example: Congress and the DoN might wish to retain two submarine yards until the [undersea superiority system] design is clear, and wait to rationalize the submarine building base after potential [undersea superiority system] yearly production rates are clear....

In a similar vein, Congress and the DoN might wish to retain two surface combatant yards until the design of the SCX is clear, and wait to rationalize the surface combatant building base after potential SCX yearly production rates are clear. In this regard, Congress could consider authorizing a modest additional number of [Aegis destroyers] to keep both BIW and Ingalls “hot” until the SCX is designed....

The key point is that the US shipbuilding infrastructure must be rationally sized for expected future austere shipbuilding budgets, and whatever fiscally prudent [Navy] transition plan is finally developed by DoN planners.⁸¹

⁷⁹ CSBA report, slide 318. See also slide 298.

⁸⁰ CSBA report, slides 318-319.

⁸¹ CSBA report, slide 319.

Summary

In summary, the following can be said about the three reports:

- The CNA report presents a fairly traditional approach to naval force planning in which capability requirements for warfighting and for maintaining day-to-day naval forward deployments are calculated and then integrated. The CNA-recommended force parallels fairly closely current Navy thinking on the size and composition of the fleet. This is perhaps not surprising, given that much of CNA's analytical work is done at the Navy's request.
- The OFT report fundamentally challenges current Navy thinking on the size and composition of the fleet, and presents an essentially clean-sheet proposal for a future Navy that would be radically different from the currently planned fleet. This is perhaps not surprising, given both OFT's institutional role within DOD as a leading promoter of military transformation and retired admiral Cebrowski's views on network-centric warfare and distributed force architectures.
- The CSBA report challenges current Navy thinking on the size and composition of the fleet more dramatically than the CNA report, and less dramatically than the OFT report. Compared to the CNA and OFT reports, the CSBA report contains a more detailed implementation plan and a more detailed discussion of possibilities for restructuring the shipbuilding industrial base.

Appendix C: Size of Navy and Navy Shipbuilding Rate

The total number of battle force ships in the Navy reached a late-Cold War peak of 568 at the end of FY1987 and began declining thereafter.⁸² The Navy fell below 300 battle force ships in August 2003 and included 281 battle force ships as of February 14, 2006.

Table 8 below shows past (FY1982-FY2006) and projected (FY2007-FY2011) rates of Navy ship procurement.

Table 8. Battle Force Ships Procured (FY1982-FY2006) or Projected (FY2007-FY2011)

82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
17	14	16	19	20	17	15	19	15	11	11	7	4	4	5
97	98	99	00	01	02	03	04	05	06	07	08	09	10	11
4	5	5	6	6	6	5	7	8	6	7	7	11	12	14

Source: CRS compilation based on examination of defense authorization and appropriation committee and conference reports for each fiscal year. The table excludes non-battle force ships that do not count toward the 310- or 375- ship goal, such as sealift and prepositioning ships operated by the Military Sealift Command and oceanographic ships operated by agencies such as the National Oceanic and Atmospheric Administration (NOAA).

⁸² Some publications, such as those of the American Shipbuilding Association, have stated that the Navy reached a peak of 594 ships at the end of FY1987. This figure, however, is the total number of active ships in the fleet, which is not the same as the total number of battle force ships. The battle force ships figure is the number used in government discussions of the size of the Navy. In recent years, the total number of active ships has been larger than the total number of battle force ships. For example, the Naval Historical Center states that as of Nov. 16, 2001, the Navy included a total of 337 active ships, while the Navy states that as of Nov. 19, 2001, the Navy included a total of 317 battle force ships. Comparing the total number of active ships in one year to the total number of battle force ships in another year is thus an apple-to-oranges comparison that in this case overstates the decline since FY1987 in the number of ships in the Navy. As a general rule to avoid potential statistical distortions, comparisons of the number of ships in the Navy over time should use, whenever possible, a single counting method.